THE METAL INDUSTRY
WITH WHICH ARE INCORPORATED
THE ALUMINUM WORLD, THE BRASS FOUNDER AND FINISHER AND ELECTRO-PLATERS REVIEW
A TRADE JOURNAL RELATING TO THE NON-FERROUS METALS AND ALLOYS.

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INDIAN HEAD IN COPPER REPOUSSÉ.

By T. T. Goerck.

The method employed in this work is strictly a hand process, no mechanical means of any description being used, from start to finish. A piece of flat sheet metal is straightened, and if it is very rough, it is planished or hammered until the desired surface is obtained. Then the outline of the design or figure is drawn on same. Then

scratched in with a pointed instrument, working over the drawn lines. This is done so that the design will not rub out, in the process of working.

After this the article has to be mounted on prepared pitch. This consists of a preparation of pitch, plaster of paris and tallow (or oil) melted together, then poured into a pan or block to a depth of two or three inches. This is left to cool off. After which the surface is warmed with a blow pipe, and the article to be worked is mounted on the block carefully, so that it will be free from air holes underneath.

After this is cool, a series of chasing tools is employed, called tracers; with these, and a chasing hammer, each line must be gone over, making it deep enough, so that it can be seen on the under side of the metal. After the design has become worked in this manner, the work is warmed sufficiently to pull it off the pitch. It is then cleaned and is ready for raising.

This can be done by one of two methods: either by mounting face down on the pitch bed and using chasing tools (raising tools), or laid on a square sand bag that is well packed, and raised or beaten up with tools and hammers. This last method (sand bag) is safer for those not well versed in the former, as it affords one the opportunity of turning the work at will, and watching the progress of same.

After the article has been properly raised it will need annealing; that is, making it soft by heating evenly to a cherry red. Care must be taken that the article is not burned while so doing. It is then cooled and put in a pickling bath to clean. Oil is then rubbed very sparingly on the under side. Warm some pitch and fill the article on the under side. This is done so that it will be free from air bubbles when mounted on the bed.

After the article has cooled, the pitch bed is then warmed with a blow pipe, and the object mounted on same. When cool, a series of chasing tools (modeling tools) is used on the surface to work out the detail. The ground is usually worked down first to the desired depth, and the modeling is carried on in the design. After this is completed the work is taken off the pitch bed, annealed and pickled and the ground, as well as design, is regulated at this stage and any defects rectified. Color, and the work is completed.

THE BRASS AND BRONZE INDUSTRY.

(Being a Recital of a Few Things Yet to Be Done.)

By Chas. T. Bragg.

It is fairly evident that the manufacture of bronze dates back farther than 2000 B. C., and that of brass to the beginning of the Christian Era. We are necessarily making brasses and bronzes along somewhat the same lines as they were made then, as far as results are concerned. True enough, we are not using calamine for zinc, nor are we using stone molds for making castings; yet in many respects the bronze of yesterday is the bronze of to-day; and furthermore, it is likely under the conditions to be the bronze of to-morrow. Of course, bronze is bronze, and brass is brass, but with the engineering problems which we are facing to-day, we are often forced to conclude that bronze is not bronze, and brass is not brass, and that both of them are very fractious children. As has been said, this may be attributed to the "natural cussedness of inanimate things," and yet we are largely at fault ourselves.

An eminent metallurgist recently said that the Brass Foundry had been neglected and was far behind her sister, the Iron Foundry. This is true, literally, and until certain conditions are overcome, the brass foundry and the manufacture of brass cannot be put on a scientific basis. It is the intention to enumerate a few of these conditions. The criticism may be advanced that one who claims familiarity with that which is needed should do something to relieve the situation, to which the reply can be made that in attempting to put the manufacture of non-ferrous alloys on a better basis in his own plant, the writer has run afoul of bad conditions and feels that the best way to correct them is to put before the brass world and its scores of allied industries a few problems to consider.

The writer is connected with a firm that leaves no stone unturned in efforts to improve its alloys, having a well-equipped laboratory and one of the finest equipped brass foundries in the country. Necessarily in this plant as in others, work must be directed toward production and the quality of the product (aside from prime metals used) can only move forward as the manufacture of equipment and additions to scientific knowledge move forward.

In view of all these things, after certainty of their truth, the following problems are suggested for consideration:

1st—The Purity of Prime Metals is a matter of importance. It is impossible to manufacture definite alloys without chemically pure metals. It is true that the producers are endeavoring with all their might and main to bring this about, but with the exception of a few high-priced metals the result has not yet been attained. (Exception must be made to certain brands of electrolytic copper.)

2nd—The Brass Melting Furnace. There is not a strictly first-class brass melting furnace on the market. Undoubtedly the furnaces now used are superior to anything of the past, and yet any chemist can show that the old coke furnace for quality of metal is still the premier of the business. Considerable experience, together with various tests on all the principal furnaces now in use, has brought these conclusions about. Some furnaces are excellent for speed, and some for convenience, but for control of temperature, and certainty of results, we are yet in the dark. A furnace which permits, and all of them do to some degree, the gases of combustion (or lack of combustion more often) to come in contact with the metal contained is not the furnace of the future.

3rd—Pyrometers that can be used in the process of melting are not to be found. There are several types of pyrometers that can be used in getting the temperature of metal while in the crucible ready for pouring, but the author has been unable to equip gas or oil furnaces with an outfit which would show at all times the temperature in the furnace.

Very recently, a representative selling what is perhaps the best-known pyrometer galvanometer in the world called on the writer for the purpose of attempting to equip a very modern furnace with temperature-reading apparatus. This he failed to do, pronouncing it impractical at best.

Let us suppose that we put a certain percentage of copper, zinc, lead and tin into a furnace. Of course, the composition changes during the time the heat is on. Let us analyze and discover then what must be done after removal from the furnace to bring the scrap produced (gates, sprues, etc.) back to the original composition on remelting. We can accomplish this in a general way, but it will never be a scientific process until temperatures

come within our control. The fault here is one that could be adjusted between pyrometer and furnace makers: *i. e.*, furnaces could be built to accommodate pyrometers, and vice versa.

4th—CRUCIBLE MANUFACTURERS AND FURNACE MANUFACTURERS are at opposite ends of the see-saw. Furnace makers claiming economy for furnaces using crucibles for containers while melting fail to make provision for the terrific heat crucibles must stand on the burner side. Crucible makers may be able to get around this by improving their crucibles, but as this is a much harder proposition, and as crucibles ought not to be expected to stand for everything, an opportunity is again before the furnace maker.

5th—The brass world is in need of a FURNACE LINING, there being nothing which will bear up for nearly the length of time that the linings of glass and steel furnaces are expected to stand. Of course, slagging, etc., is largely cut down by the judicious use of fluxes, but cracking, peeling, etc., are deep-ribbed faults at the bottom of lots of trouble.

6th—We need BOOKS. There are a few books dealing with the art of brass and bronze manufacture. These, however, are largely literary records of observed events rather than observations taken along the straight and narrow paths of science. True, there is scattering work being done to improve the making of alloys, but not so much for the information of the world as to obtain methods to be used in private, or produce alloys to be patented, etc. An analytical chemistry dealing completely and entirely with the analyses of the non-ferrous alloys is sadly needed.

7th—We must look largely to COLLEGES to do what real investigation there is to be done. It is safe to say, however, that where one professor is working on non-ferrous alloys, in this country at least, a dozen are working on ferrous alloys. There are notable exceptions to this statement, but they are rare. The writer is a graduate of one of the best known technical colleges in this country, but if the word "brass" was ever mentioned during his attendance at that institution, it was on one of those occasions when he was showing a visiting aunt about the campus. That was not a fault of the institution, but merely a result of the fact that the condition has not been understood, and the importance of the brass world underrated.

It is not the purpose in the above to criticise nor complain, but merely to put forth, as the writer sees it, a few things worth considering, with the feeling that the seedling thus set afloat will light on fertile soil.

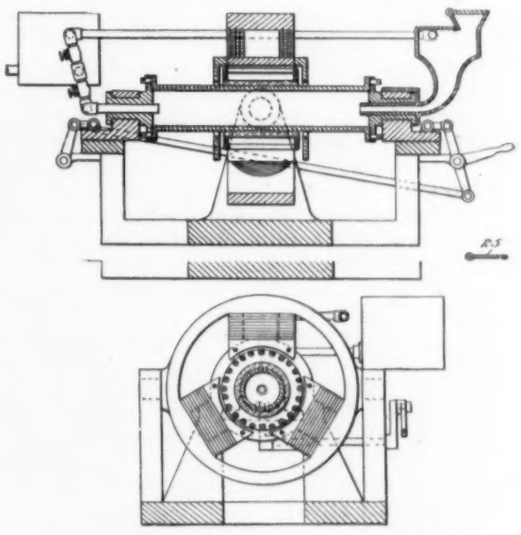
The Consul General at Frankfort, Germany, states that it would be worth while for American manufacturers of watches to make increased efforts to augment their sales in Germany, and Frankfort-on-the-Main, being a chief distributing center for southern and middle Germany, would be a good place from which to push their goods. During last year 355,938 gold watches, 846,189 silver watches, and 458,057 watches in steel, nickel and other cases were imported from Switzerland into Germany.

The United States Consul, writing from Barcelonia, Spain, gives the following result of a recent visit of a representative of one of the largest New England manufacturers of silver to that city: "He found practically no market for these wares here and abandoned all idea of going to Madrid and Bilbao, the other two places of his itinerary, as planned. American heavy silver plate and plated ware was too expensive for the Spanish trade and the market also limited. He received an order for $200 worth of goods, which was regarded as a large order."

METHOD OF CASTING HOLLOW METAL BODIES.

An invention for which letters patent were issued August 11, 1908, to George Hillard Benjamin, of New York City, and by him assigned to the Coe Brass Manufacturing Company, of Torrington, Conn., relates to a method of casting hollow metal bodies, especially such as are formed of a metal or alloy which is freely oxidizable when at the casting temperature. The invention consists in casting the molten material of which the hollow metal body is to be formed into a reducing atmosphere, and while therein subjecting it to the action of centrifugal force. In this machine there is a hopper through which the molten metal is fed into the cylinder. A tank containing a reducing gas is connected by a pipe to the interior of the hopper and also by a pipe to the interior of the cylinder.

It is essential in a machine of this character that the cylinder have its axis of rotation maintained horizontal and that the rotation be uniform. While the cylinder may be rotated by any suitable means, it is here shown provided with a polyphase electric motor.



CASTING HOLLOW METAL BODIES.

In operating the apparatus the cylinder and hopper are filled with a reducing gas, as carbon oxide or hydrogen, at a pressure double that of the atmosphere. After these have been charged with gas the cylinder is rotated at a speed varying from 900 to 2,500 revolutions a minute, depending somewhat upon the temperature at which the molten metal is charged into the cylinder.

As soon as the rotation of the cylinder is effected, the molten metal is slowly poured into the hopper, the pressure of the gas in the hopper and cylinder being maintained. The metal flows from the hopper into the cylinder and by centrifugal force is distributed to the inner side of the cylinder, distributing itself uniformly over the entire interior of the cylinder. The pouring is continued until a hollow body has been formed of the required thickness. During the entire pouring and for some minutes after it has ceased the pressure of the reducing gas within the cylinder is maintained. This gas acts first to remove the air from the cylinder; to effect a chemical combination with any occluded air carried by the heated metal, and to reduce any oxide that may be formed on the metal or alloy in the melting operation or during the pouring.

MACHINE MOLDING.

By Joseph H. Hart.

JOSEPH H. HART.

To an outsider the question of molding machines is a simple matter. It is essentially a labor saving device, and, of course, should be used. The matter is not nearly so simple as it thus appears on the surface. Molding machines have undoubtedly come to stay, and satisfy a distinct want as can be easily witnessed by the large number of different types of such machines on the market. However, none of these machines is perfect from a mechanical point of view. Every one lacks one or more of the essential details of the mechanical operations for the completed mold and while some are more efficient in one procedure than another, not one is equally efficient in all phases.

Thus, the principal operations in molding consist in filling the flasks or molding chambers with sand, ramming, withdrawing the pattern and then leaving the mold ready for pouring. In addition, as minor problems, enter devices for conveying the mold to the furnace and placing it in position for pouring, rapping the pattern for removal and placing cores. In some developments the filling is the most important feature, in others ramming, while some machines have the removal of the pattern as the chief feature of the device, or the complete elimination of the pattern as such.

Many attempts have been made to do away entirely with labor in this work and to produce complete molds with the aid of machinery, even including the conveyance to its position for filling, but without complete success. Apparently, a complete and satisfactory solution will involve too much and too complicated a mechanism than seems to be required by the exigencies of the problem from a commercial aspect.

The model machine, in order to be successful, should be simple in construction and operation, and cost of operation and maintenance should be such that ultimate cost of finished product should be reduced. No machine on the market to-day satisfies this demand. They are all more or less unsatisfactory and limited in their utility and applicability.

Undoubtedly molding machines and machine molding in general find their highest development in foundry work in which a continuous run of the same kind of casting is common and this is, of course, in specialization foundry work. This specialization has gone on to a certain extent. It is recognized to-day from requirements in molding and preparation of the metal that iron and brass foundries should be separate and distinct entities. Again, in a general way, foundries are divided into classes, the character and kind of material forming the finished product. Thus, only a limited number of foundries are equipped for very heavy work. Again, others do all medium size work in job lots; still others are limited in their usefulness and best efficiency of operation by small castings generally in multiple form in extremely large number of units.

In the multiple molding trade of small units, the average foundry-man is not an active competitor since he cannot meet the price set by the man who has available economies for this type of work. Machine molding undoubtedly comes in the latter class, and it is undoubtedly this question of specialization in foundry work. Its unsettled limitations and the unsatisfactory conditions of the molding machine to-day have led to the present stage. The situation exists to-day that machines are sometimes used and sometimes not used in identical conditions. Again, even when such machines are available their utilization is questioned and their range of applicability is in doubt. Further, the question of specialization in foundry work has only recently arisen to a critical point. It will undoubtedly continue in this condition until much further and more concentrated specialization is here, so there is no relief for the foundry-man from this situation except to build a satisfactory molding machine with a thorough knowledge of its limitations and possibilities at hand and a further knowledge in regard to special conditions in foundry practice, and the specialization in the character of work done. Thus, even in patterns there are bound to be certain classifications which will become more pronounced in the future than they have in the past.

Molding machines have certain limitations in regard to character of patterns permissible with their use and these limitations will become more pronounced with increased efficiency and increased competition in this field.

In the first place, the majority of molding machines operate vertically. The drag and copes are generally made in individual units and match-boards are extremely common. Again, the rapping the pattern and stripping device must be used in removing the pattern from the mold. In the majority of machines this is largely a hand process. The machines either operate by pressure from above or a lift from below, and may be operated by hand power or air or steam or water pressure.

Again, the problem of conveying the mold to its position for pouring devolves upon the machine or upon a conveyor or upon hand labor. Thus, at the very beginning we have a classification of patterns, in the two classes depending upon the condition of situation for power. Further, they should remain in position for the pouring, or it should be turned through 90°. This, of course, is largely a question of placing the gates properly, but undoubtedly this is one of the prime questions which is a difficulty in machine molding and the elimination of which would simplify the problem at hand. Thus, the horizontal molding machine with the gates vertical leaves the cope and drag in position for pouring or should be deposited so that the belt conveyor is in a satisfactory foundation for pouring with minimum labor. This is one of the first conditions to be met, and brings us to the chief question in the foundry work, which is the classification of patterns. Unless this can be accomplished with more satisfaction than it is at present, the questions of molding machines and their applicability will remain unsatisfactory.

The next step in the progress of molding machines is undoubtedly the unification of cope and drag into one piece. The applicability or utilitarian value of this improvement is not thoroughly recognized even with the ordinary machine or hand moldings. It would cut the number of units almost to one-half, and this is a matter of prime importance even in the most developed machine mold. The horizontal machine uses face plates instead of patterns and in this the unification of the cope and drag is very satisfactory, but has not extended to anywhere near the extent the situation would seem to warrant. Undoubtedly, the horizontal machine with either face plates or pattern and stripping plates is bound to prove more satisfactory in the long run than any of the machines

at present on the market. The establishment of gates in the pattern in this situation could be made such as to become available for clutches for removing the pattern from the mold, and is quite an available means of satisfactorily making face plates for such a machine in multiple molding, and is sure to prove of pronounced benefit to the trade.

The question of molding finds its analogy with a few additional limitations in the modern brick-making machine. Compressed bricks, often of complicated make, are easily made, the filling, pressing and removal being entirely automatic. The extra limitations in molding are due solely to the variety of work and materials necessary. Thus, as has been said, machines should be classified according to patterns into those in which the gates can be put in vertical and used as handles for rapping or grasping. With this type the horizontal machine in some of its present or possible forms is undoubtedly superior. The question of cope and drag making is to increase in efficiency as a result of this, but will tend to accentuate the problem at hand. The only object of the molding machine having complete and satisfactory status in this field is that it shall become more localized in regard to its individual work and in regard to the general character and scope as well. This involves not only the classification of patterns into distinct types for best availability upon different machines, but a thorough and working knowledge on the part of the operators of this classification and the availability of readily disconnecting this, will only come with increased pressure for specialization in this work, and undoubtedly the time is not entirely ripe for this development. Thus, the molding machine is but one phase of foundry development. It is an important one to be true, but the others require attention, and as the average foundry-man experiences it, what is equivalent to the selling in a business is the most important factor after all.

THE ALUMINUM INDUSTRY IN SWITZERLAND.

The condition of the aluminum industry in Switzerland is similar to the conditions in Great Britain, which were described in the August issue of THE METAL INDUSTRY. The Swiss situation is really the European situation, for the combined Swiss works rival the American in size and horsepower. At present in Switzerland aluminum is selling at 16 cents per pound, due to competition and overproduction. The output of the Swiss Works have been increased tenfold the last three years and when the demand for metal fell off with the general business depression, the aluminum company could more than take care of the market. It is therefore the policy of the company that whenever the demand for metal falls below their output they operate a part of their plants in the manufacture of carbide. When the demand for metal is sufficient to keep their works going they devote all of their attention to the manufacture of aluminum. The consumption of the metal in Switzerland and Europe is for similar purposes to the uses in the United States; viz.: electrical conductors, cooking utensils and automobiles. The officials of the Swiss Works believe that in the future the largest consumption will be for cooking utensils. At present the Swiss Company, whose official title is Aluminium-Industrie Actien-Gesellschaft, with headquarters at Neuhausen, Switzerland, has 100,000 horsepower in operation distributed at the following works: Neuhausen, Switzerland, Rheinfelden, Germany, Lend, Austria. Besides these plants, which have been in operation for a number of years, the company have started a large works at Sierre, Switzerland, which is one-third finished.

THE CHEMISTRY OF ALLOYS.

(From our Birmingham Correspondent.)

There was an unusually large gathering at a meeting of the Birmingham (England) Metallurgical Society on Friday, April 3rd, to listen to a lecture by Walter Rosenhain, B.A., B.C.E., superintendent of the Metallurgical National Physical Laboratory.

The lecturer spoke for over an hour on the subject of "The Chemistry of Alloys," dealing especially with their constitution and internal structure, the lecture being illustrated by a large number of remarkably beautiful and striking slides. The mechanical properties of alloys depended not only on composition, but treatment, and a full understanding of those properties had only become possible through that young and vigorous science "metallography." Less than twenty years ago alloys were practically "terra incognita" to the chemist, although efforts had long been made to solve their mystery. Previously chemists had sought to extract various chemical compounds by mechanical separation or by means of differential chemical attack. Both methods were only very partially successful. As an example the lecturer exhibited a specimen of crystals of the compounds $CuAl_3$ obtained by pouring off the molten metal from a half solidified ingot of suitable composition. But even these beautiful crystals were contaminated by metal of different composition. The new era had only begun when the pyrometer and the microscope were systematically applied to the study of alloys.

After indicating the method of taking cooling curves of alloys with modern pyrometers diagrams were shown of alloys of zinc-cadmium, bismuth-tin, copper-silver, lead-tin and others. He mentioned that investigations by experts are being carried on, and would be continued until they demonstrated what were likely to be the limits of possible usefulness of the valuable alloys. The work was being done in an accurate and scientific manner, and would be dealt with thoroughly and completely.

A number of diagrams were exhibited of work done by the Gottingen School of Metallurgists, but the lecturer warned the meeting that those matters still required further investigation, because the means of temperature measurement, and the quantities of alloys employed, were often quite inadequate to warrant the conclusions based on them, while the quantitative interpretation of some of the thermal-phenomena was pushed to an undue extent. The full investigation of the simplest system of binary alloys was a much more difficult matter than he had supposed until he had actually tried it.

In regard to microscopic studies the lecturer pointed out that the microscope could usefully supplement the pyrometer in the construction of equilibrium diagrams. The series of lantern slides showed the typical structure of pure metals, solid solutions, eutectic alloys, and the progressive changes of structure. The conclusion of the lecture was devoted to questions of cooling and heating, a most interesting feature being the exhibition of a special apparatus recently devised by the lecturer for carrying out efficiently the operation of quenching. By means of this the metal is heated electrically, while placed in an exhausted tube made of vitrified silica. When the desired temperature is reached and the specimen has to be quenched, cold water or other fluid is admitted to the interior of the exhausted tube into which it rushes with considerable violence, thus quenching the specimen without exposing it to the air or removing it from the furnace. The fact that this somewhat startling operation can be safely performed is due in the first place to the remarkable properties of fused silica, and secondly to the detailed arrangement and dimensions of the apparatus.

TREATING CRUCIBLES TO RENDER THEM MOISTURE-PROOF.

An invention patented by William Roy Mitchell, of New York City, August 4, 1908, relates to a process for treating crucibles to render them moisture proof and proof against scalping and cracking when heated. Crucibles and pots are now subjected to an annealing process under heat to drive out the moisture present in the walls, so that the high heat necessary to melt metals would not convert the moisture into steam which, expanding quickly, would crack the vessel.

The new process consists in first heating the crucible slowly to a high temperature, after which it is filled or partly filled with copperas and the high heat continued until the copperas has been absorbed by the walls. During the heating of this substance in a crucible some of the pasty mass is absorbed by the walls, while the remainder solidifies. That which is absorbed closes up the pores so that moisture cannot enter, thereby preventing cracking and scalping. The process may be repeated as often as may be necessary, it being understood that the oftener it is done the harder and more durable the crucible will become.

PROCESS FOR HARDENING TANTALUM.

According to patent specifications for a process for hardening tantalum, granted to W. Von Bolton, of Charlottenburg, Germany, and by him assigned to Siemens & Halske, tantalum possesses many properties which are similar to those of iron. For instance, iron becomes very hard with the addition of a very small proportion of carbon; the same is true of tantalum, which may be hardened in this way by heating it to glowing in the presence of carbon. In addition to carbon, many details, such as aluminum, tin and titanium, are applicable for this purpose.

The mixture may be made in different proportions, varying from an extremely small proportion of the added substance, up to 1 per cent. or more, according to the degree of hardness desired. In the case of carbon, the tantalum becomes very hard and resistant as soon as a very small fraction of 1% is added. If the proportion is greater than this, the tantalum soon becomes very brittle, so that it can no longer be used for most of its purposes.

By changing the quantity of the added material, the degree of hardness and also the degree of tensile strength of the metal may be altered within very wide bounds. If, for example, the tantalum is to be made into wire, especially into fine, drawn out wire, then the degree of hardness must be selected which will allow the metal to be drawn out in the usual manner without becoming broken or receiving fissures upon its outer surface. If, on the other hand, it is to be used for the construction of tools for wood working, stone working, metal working or the like, or for the construction of bearings, wheels and the like for machines or clock works, etc., one must give the tantalum a very much higher degree of hardness and the malleability and tensile strength need not be given so much consideration. For this latter purpose, the proportion of the added material would be higher than it would be for the manufacture of drawn out wires and such uses.

While the Hall patents for the production of aluminum have been open for many months, the industry still remains practically in the hands of one concern. There have been many rumors that outside interests would take up the production on more or less large scales, but these have not as yet come to the active stage.

BRITISH NOTES.

(From Our Birmingham Correspondent.)

FRAUD DETECTED.

There has been an interesting prosecution this week in connection with what is known as gold-filled jewelry. Henry Russel Crompton, a manufacturing jeweler, trading as Robert Crompton, of Northampton street, Birmingham, was summoned before the magistrates under the Merchandise Marks Act for selling twelve chains and lockets under a false trade description. The prosecution was on behalf of the Birmingham Jewelers & Silversmiths' Association. The goods were described as "18-carat gold-filled finest quality." On analysis of one of these articles it was found that whereas the weight was 198 grains, it contained one .19 of a grain of gold, which was something less than a half-penny's worth. Another one contained only a farthing's worth, and it was contended that the true description should have been "gilt." Frank Haseler, the chairman of the Jewelers' Association, said that gold-filled articles should be manufactured from material which in the rough was a sheet of gold applied or sweated to a sheet of metal or composition. Other firms were making these goods and they were also made abroad and sent into this country in large quantities. "Gold-filled" was a comparatively new term, first used in connection with American watches. "Rolled gold," "gold plate," and "gold-filled" were practically synonymous terms. It was complained that to apply such terms to the articles made by defendant would damage the legitimate trade in gold-filled articles. Another witness, Mr. N. C. Reading, said that a dozen such articles could be gilded for 3d. He believed the prosecution would be approved by every manufacturer in Birmingham, who were all anxious to secure the purity of the trade. The defendant said he had adopted the term on the initiative of Americans and Germans who first introduced it. He thought the term meaningless and the process by which the articles were made was electro-gilding. He was fined £5, and £15 15s. for extra legal costs.

TRIAL OF THE PYX.

There was an interesting ceremony at the Goldsmiths' Hall, London, on Wednesday last, when the Goldsmiths Company made their annual test of the National Coinage. This has long been known as the "Trial of the Pyx." In its ancient form it dates back to the time of the Plantagenets when the trial took place before the King, but the matter is now under the authority of the Chancellor of the Exchequer. The Keeper of the Mint takes indiscriminately from each "journey weigh" to the Mint certain coins which are placed in the Pyx during the year. The jury are charged by the King's Remebrancer and have to take an oath that they will discharge their duty of testing the coins using all the ability their accomplishments admit. Afterwards the Jury of Goldsmiths return their verdict, which is duly recorded.

RUSSIAN BLACK SILVER JEWELRY.

Consul W. W. Masterson, of Batum, states that there are no manufacturers of jewelry, as the term is understood in the United States, engaged in the manufacture of novelties in jewelry in that part of Russia, but that there is made by hand in Batum in little shops novel and beautiful silverware called "Georgian work." It is an inlay of almost black silver in fancy designs on the white silver background, and the work is used in spoons, cups and mugs, belts and buckles, tea sets, and in fact in everything in which ordinary silver is used. The makers of the ware profess to keep the process of making this dark silver inlay as a trade secret.

THE FRENCH HALL-MARKING PROPOSALS.

(From Our Birmingham Correspondent.)

The French proposals in regard to Hall-Marking are equally interesting to the Sheffield silversmiths as to the jewelry trade of Birmingham, and for the purpose of considering them a special meeting of the committee of the Sheffield Chamber of Commerce was held on June 1st, the president, Mr. A. J. Hobson, presiding over an influential attendance. A lengthy letter was drafted to be sent to the Board of Trade strongly opposing the concession asked for by France, and it was decided to exert the strongest influence with the Sheffield members of Parliament. The letter goes somewhat over the same ground as the Birmingham communications already referred to. It is pointed out that while English silver sent into France has to be assayed and stamped with the French Hall-Mark before being offered for sale in France, and in addition is subject to customs duties, French silver coming to England is subject to no duty. Nearly all French silver is of the lowest standard, and the effect of the concession would be either to drive English silver out of the market or to necessitate the lowering of the English standard, and if the concession were made to one nation similar concessions would no doubt be asked for by other nations, and in some instances, notably the United States of America and Germany, there are no government regulations as to the quality of silver. It is pointed out also that the French Hall-Mark is the only one put on English silver by the French government, although the English article contains 925 points to the thousand, or nearly equivalent to the French highest standard of 950 points. Thus the high-class English article receives only the second quality Hall-Mark. "The British Lion on silver goods is the most valuable trade-mark in existence in the world, and its value would be destroyed if silver goods from various countries and of varying degrees of fineness were to be imported freely without any British Hall-Marks upon them."

On the same day a special meeting was held in London, presided over by Mr. Henry Pearson, and representing the silverplate trade of London, Birmingham and Sheffield. A strong resolution was passed pointing out the injustice done to the English silver trade, entailing, as it does, the practical abolition of the English Hall-Mark. It was decided to ask for a deputation to wait on the president of the Board of Trade, and it was explained that steps have already been taken to guard against any immediate action being taken to admit French goods under the conditions asked for.

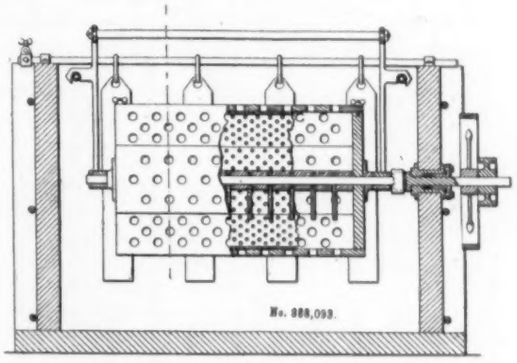
The matter has also been before the Coventry Chamber of Commerce and a resolution was carried declaring that the maintenance of the integrity of the British Hall-Mark is of such vital importance to the welfare of the industries of the district no arrangement for the recognition of foreign Hall-Marks should be made without the knowledge of and consultation with the members of the jewelers, silversmiths, and watchmakers' trades in London, Birmingham, Sheffield and Coventry. At this meeting there was a strong complaint that the affixing of the English Hall-Mark to foreign goods enabled such goods to be sold so as to lead to the impression that they were English made.

The production of Bauxite in the United States in 1907 amounted to 97,776 long tons, valued at $480,330. This was an increase of 22,444 tons over the previous year, or almost 30 per cent. The average price of the material at the mines was about $4.91 per long ton. The importations of bauxite for the same period were 25,066 long tons.

MECHANICAL ELECTROPLATING APPARATUS.

The usual mechanical plating device is provided with a revolving container or basket provided with holes for the flow of the plating solution to the articles in the basket. Generally these holes are of such size that small articles pass through or are liable to become stuck fast in them.

In an invention by Willis R. King, and by him assigned to the Hanson & Van Winkle Company, of Newark, N. J., which is dated May 19, 1908, the baskets are made with larger perforations so as to offer practically no resistance to the current as compared with the resistance offered when a wooden barrel is used with fine perforations. Within this barrel is placed a flexible and perforated sheet of non-conducting material, such as celluloid or vulcanite. The perforations of this sheet are variously disposed and are very small, so that the smallest articles can be handled without any possibility of their dropping through the larger holes in the basket. The



MECHANICAL ELECTROPLATING.

sheet is made to slip within the basket after the manner of a cylinder.

With such a basket or container it has been found in practice that the resistance to the current, as compared to that presented with a wooden basket formed with fine holes, decreases from 80 to 90 per cent., thus enabling the work to be plated in a similar reduction of time. With a diaphragm made from celluloid, vulcanite, or the like, having a thickness of say 15/1000 of an inch, as against the usual perforated wood container of at least 3/4 of an inch, and with a larger number of perforations in the diaphragm and a smaller number of large perforations in the wood container, or the interstices between the rattan reeds of a revolving basket, the electro-plating is more thoroughly done and in less time, and with a great saving in the item of expense.

PRODUCTION OF SPELTER IN U. S. IN 1907.

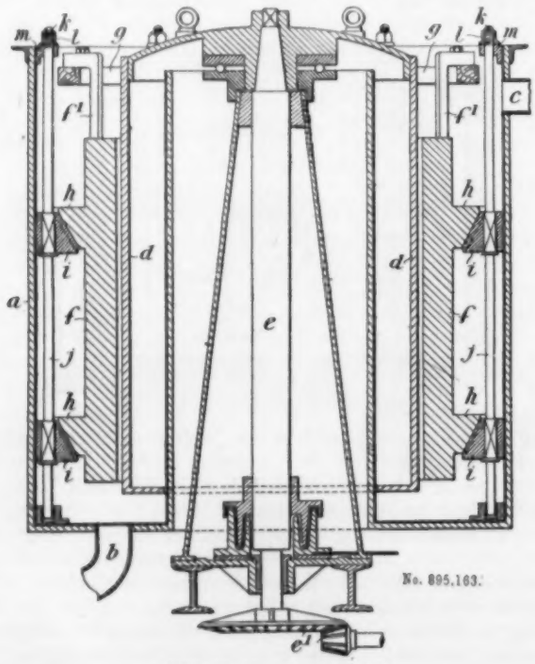
From an advance statement of the production of spelter in the United States in 1907, issued by the Geological Survey, we learn that it amounted to 249,860 tons, as against 224,770 tons during 1906. For the same periods the consumption of spelter was 228,509 and 221,781. Last year the world's production of the metal was 813,842. By states Missouri ranked first with 141,824 tons, Colorado with 26,077 tons and Wisconsin with 15,273 tons. Of foreign countries Belgium is first with 170,307 tons and Silesia second with 152,860 tons.

When gold is deposited on glass by means of a cathode discharge in a vacuum, or by electrolysis, two forms are often obtained: One green, and the other blue by transmitted light. The first is pure gold while the second has been shown to be a rather indefinite compound of gold with hydrogen.

ELECTRO-DEPOSITION OF COPPER.

According to an invention for which letters patent have been issued to Sherard Osborn Cowper-Coles, of London, England (August 4, 1908), copper produced by the usual method of electro-deposition upon a stationary or slowly revolving cathode lacks tensile strength and is porous. Attempts have been made to overcome this fault by rotating the cathode at a high speed or by burnishing the metal during the deposition, but the burnishing produces laminations. The following is taken from the patent specifications:

"Now, I have found in practice that copper possessing the advantages of hard rolled copper of high tensile strength and free from porosity can be electrodeposited at a rapid rate by revolving the cathode at a peripheral



SECTIONAL ELEVATION.

speed of from 1,500 to 2,000 feet per minute when employing a current density of 200 amperes per square foot of cathode surface and an electrolyte containing 12.5 per cent. of copper sulphate and 13 per cent. of sulphuric acid at a temperature of 40° centigrade. I have also found that the tensile strength of the copper produced increases with the increase of the speed of revolution of the cathode above 1,500 feet per minute."

In the accompanying drawing *a* shows the electrolytic vat having an inlet *b* and an overflow outlet *c*. The cathode *d* is secured to the upper end of the spindle *e* mounted in suitable bearings and arranged to be rotated by the bevel gear shown. The anode segments *f*, *f* are supported by rods on the angular frame *g*. These segments may be adjusted in position relatively with the cathode by means of the wedge-shaped projections *h*, *h* formed upon the segments and which engage with the wedges *i*, *i* upon rods *j* vertically mounted within the vat and provided at their upper projecting ends with screw threads *k*, with which the nuts *l* engage. By turning these nuts the rods can be raised so as to shift the anode segments inward to the desired extent.

SILVER FINISHING AND POLISHING.

The Various Methods and Most Progressive Features.

By Andrew Hellthaler.

The methods of silver finishing are as varied as the colors of the rainbow, almost every factory having a system different from all the others, and the results are almost as varied as the methods. This is due entirely to the endeavor of various manufacturers to produce articles like those turned out by some competitor, at a lower figure, and to the detriment, I believe, of first class finishing, very little of which is done to-day except upon special order.

The first thing to be considered in silver finishing is the preparation of the article, already shaped by spinning, stamping or the hammer, for the application of whatever mounts may be wanted upon it, such as feet, handles, borders, etc. This preparation consists of sand bobbing the article, removing all fire that may be in the silver, at least 1½ inches further out than the mounts extend, so that fine stoning around the mounting will not be necessary, thus saving on ordinary jobs about 6 hours. This only applies to the past methods of fine stoning all around borders and mountings, an operation oftentimes consuming more time than all the other operations put together. The new method does not in any way prevent the finisher producing a cleaner and neater piece of work, while it at the same time lessens the cost of the work and does not require so much skill.

After this, the first operation, has been gone through and the article is complete in its make-up, the actual finishing begins. While many finishers endeavor to bob an article all over, no matter what shape it may be, there is a hard and fast rule to be followed in bobbing shapes, as follows: Flat bottoms, concave bottoms, and all perfectly flat surfaces must be pumiced and fine stoned. Convex or slightly raised surfaces must be pumiced and can then be bobbed, thus saving fine stoning. All other shapes, surfaces, etc., can be bobbed, eliminating stoning in its entirety.

The bobbing of a piece of work is by far the most difficult branch of silver finishing, requiring the most skill and careful judgment, inasmuch as ridges and hollows can be cut into the finest made piece of work by the finisher if he does not handle his bobbs correctly. For first class bobbing walrus hide must be used. Some firms use felt, owing to the difference between the price of felt and walrus hide. Walrus is the best by far since you get a first class finish, while with the other you do not. Once a finisher has a set of walrus hide bobbs they last him for years, while felt last no time at all, wearing out rapidly and never giving satisfactory results. All walrus hide bobbs should be pounded soft with a hammer, the softer the better; this is a point a great many finishers do not know, consequently they prefer felt; but one thing is certain, all first class finishers want the walrus hides.

Another mistake made by a great many firms to-day, as well as finishers, is the grade of pumice they use in bobbing, they having an idea that coarse grades, cutting quicker, give the best results. This is a very grave mistake, as the fine pumice gives such a clean surface that brushing is absolutely unnecessary, thus saving the cost of brushes as well as the time of the extra operation. Bobbing should never be done with a coarser grade of pumice than No. 0. A piece of work treated in this way only requires a small amount of brushing around the mountings and nowhere else. One small two-row brush is all that is necessary for a dozen bread trays, etc. You can readily see the saving on work done in this way.

All brushing should be done with tripoli and oil. This having been accomplished, the next operation is grease buffing, the easiest operation in finishing. This is done with a cloth buff and tripoli composition. With this all bobb and brush marks are buffed out, so that a clean color is brought up on the metal.

Buffs of all wool are by far the most preferable, but no work on silver should be done with the buff worn down to the stitching. When a buff becomes worn down that far the stitching should be opened to render the buff soft. With silver the operation is directly the opposite of all the other metals. In handling brass, copper, etc., the harder the buff, the better the result, and it is to this cause alone that the brass and copper finisher owes much of his poor work when he finds employment in a silver shop.

The effect of using a hard buff on silver is the working of a cloud in the metal through the friction and heat. This cloud is very hard to remove and it consumes too much time. This is the only thing to be considered in grease buffing.

Polishing, the next operation, requires very little explanation. The same rules apply as in grease buffing, except that the buffs should be made of canton flannel, and rouge should be applied instead of tripoli composition, the rouge being first dipped in kerosene oil each time before it is applied to the buff. This permits the easy washing of the article, as the oil prevents the rouge from sticking around mounts and borders.

Oxidized borders should be oxidized before polishing. All work should be dipped in "fire acid" before any finishing is started in order to remove fire from the job. This acid consists of ⅓ nitric acid to ⅔ water and is used hot. The best way to heat it is to place a sheet iron box filled with sand upon a gas stove and on this put the stone jar containing the acid. The acid should be very hot, but not boiling.

ELECTROLYTIC PROCESS FOR THE PRODUCTION OF METALLIC DARK COATINGS UPON METALS.

This rather long title we find upon letters patent issued to Alexander Classen, of Aachen, Germany, June 30, 1908. The intention of this invention is to produce a quite uniform metallic deposit of pure black or deep blue color. It permits of the most different kinds of articles, as, for example, parts of weapons, being provided with a dark dull coating, and is particularly suited for depositing nickel, but may also be used for other metals. The process is carried out in the following manner:

(1) They are polished; (2) the polish is then dulled either by dipping the articles into an acid bath, or by means of the sand-blast; (3) the articles are then subjected to the action of an electric current of such a tension as is necessary for producing white shining nickel, namely in a bath which contains, besides the ordinary salts, a decoction of licorice-root or licorice-root itself; (4) after the deposit is produced in this manner the tension is suddenly reduced considerably without removing the articles from the bath. The articles thus treated have the desired appearance.

Good results are obtained with an electrolytic bath of the following composition:—20 kg. sulphate of nickel, 4 kg. sodium sulphate, 1 kg. choloride of nickel and 0.5 kg. boracic acid are dissolved in 100 liters of water, and 5 kg. extract of licorice-root, or simply the root itself, is added to the solution thus obtained. This composition of the bath is only meant to serve as an example and may be replaced by any other which is based on the known employment of licorice-root or of another material of like action; such materials are glucosides, phloroglucosides, phloroglucides and the like, or nitrogenous glucosides or their derivatives, or, instead of these substances, extracts of plants, roots or barks which contain the named substances or one of the same.

A PRACTICAL ROSE GOLD SOLUTION.

By Charles H. Proctor.

In recent years no finish has been produced upon metallic articles of personal adornment that has held its popularity as Rose Gold, with perhaps the single exception of the French Gray. Upon all the new creations for the Fall and Christmas trade this finish still predominates and is likely to for some time to come. This is no doubt due to the peculiar richness caused by the contrast between the rich dull finish of the background and the semi-lustre of the high relief parts. When a highly polished article of gold is placed by the side of an article finished in rose gold it has the appearance of red brass in contrast to the beautiful soft lustre found in a well executed rose gold finish.

In experimenting with numerous formulas for the production of this finish I found that the rose finish in nearly all cases could not be produced without the application of the sand blast or other means of producing a dead surface. In some formulas the acid copper is advised, and while this method is satisfactory for cheap articles of gold, it is not advisable because a few minutes in the acid copper bath gives quite a thickness of deposit; and as soon as the rose finish becomes worn a copper color appears, which becomes oxidized very readily.

Of the numerous formulas prescribed, the yellow prussiate of potash, carbonate of potash, and chloride of gold combinations are stated to give excellent results. This formula produces a rose finish on yellow. The addition of copper to obtain the desired effect is not advisable, owing to the karat effect liable to be produced. The various phosphate of soda and bisulphate of soda combinations have been tried, but these do not produce even as good a color as the prussiate of potash formulas, although for light color gilding and for brightness of deposit they are more desirable.

The formula that I have found gives the most satisfaction and one I have been able to find in any text book upon plating or in any publication relating to the deposition of metals is composed of ammonuret or fulminate of gold, cyanide of potassium and hyposulphite of soda. With this the rose gold effect is no doubt caused by the soda salt, as the fulminate of gold in potassium cyanide was one of the earliest formulas used in electric gilding, and in many of the older manufacturing concerns is still in vogue owing to the richness of the gilded deposit.

The solution is prepared as follows: 1 troy ounce of 24 karat gold is dissolved in aqua regia (3 parts hydrochloric acid and 1 part nitric acid), using about 6 ounces of the mixed acids. Heat is applied with a sand or hot water bath to assist solution. As soon as the gold has been dissolved, clean cold water should be added, as it is not necessary to evaporate the solution to produce the neutral chloride of gold used in many other gilding formulas. For the purpose of precipitation a regular gallon glass battery jar can be used to advantage, as the precipitate can be more readily observed. Place the diluted gold chloride solution in the jar and add more water until about two-thirds full; now add 26% ammonia water very carefully until all the gold has been precipitated as a brown spongy mass. If care is exercised every particle of gold can be thrown down, but an excess of ammonia must be avoided as gold salt is somewhat soluble in ammonia. The precipitate should be allowed

to settle and then the clear ammonia water should be siphoned off. At least four washings should be used to remove all trace of the ammonia. The precipitate is now fulminate of gold, which should always be kept under water as, if allowed to become dry, it is a violent and dangerous explosive.

A solution of cyanide of potassium should be prepared by dissolving the cyanide in clean cold water until 4½ degrees Baume is reached. Now to 4 gallons of the cyanide solution add the 1 ounce fulminate of gold and a perfectly clear liquid will result. To each gallon of solution add ½ ounce of hyposulphite of soda and it is ready for use.

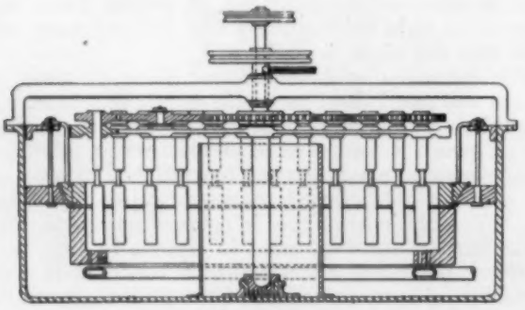
Maintain the bath at 160 to 180 degrees. The anodes should be of 24 karat gold, but platinum, or electric light carbons free from copper coating may be used. A current strength of 2½ to 4 volts can be safely used, but the amperage must be very low on account of the rapidity of the deposit.

This formula will gild any article made from the copper-tin alloys by simple immersion. Articles made from the base metals, such as lead and antimony, spelter and iron, when brass or copper plated, can be readily gilded by immersion and a good color can be obtained. When only a gold effect is required a few seconds immersion will produce a rich yellow color.

To obtain the rose gold effect upon cheap articles, when only a film of gold is desired, the acid copper deposit is advantageous; but the high lights should be first relieved by finely pulverized pumice stone. After gilding bicarbonate of soda should be used in relieving the high lights. For articles of karat gold a few seconds immersion with a fairly strong current will be sufficient. To produce the light rose the current should be reduced a few seconds after the strong current has been applied. This method yields a rich rose gold which, when relieved in the usual way, gives excellent results. When an extremely dark rose gold is required a little more hyposulphite of soda may be added, or when the color is not sufficiently deep. The fulminate of gold should be added when occasion requires it, but when anodes of pure gold are employed it is not very often necessary to make such addition, as gold is very soluable in the solution, due to the excess of cyanide. The solution needs very little attention if the right temperature is maintained and very little experience is required to obtain the best results.

MANUFACTURE OF CARTRIDGE CASES ELECTROLYTICALLY.

On August 4, 1908, letters patent were issued to Sherard O. Cowper-Coles, of London, England, for covering the production of cartridge cases and similar articles by electric deposition. In carrying out the invention a mandrel of brass or other suitable metal is prepared, which corresponds to the internal diameter of the cartridge case. This is caused to revolve at a high rate of speed, say from 1,000 to 1,500 feet peripheral speed per minute, in an electrolyte containing the metal it is desired to deposit, and at the same time the electrolyte is projected under pressure on that portion of the mandrel which does not revolve at the required critical speed.

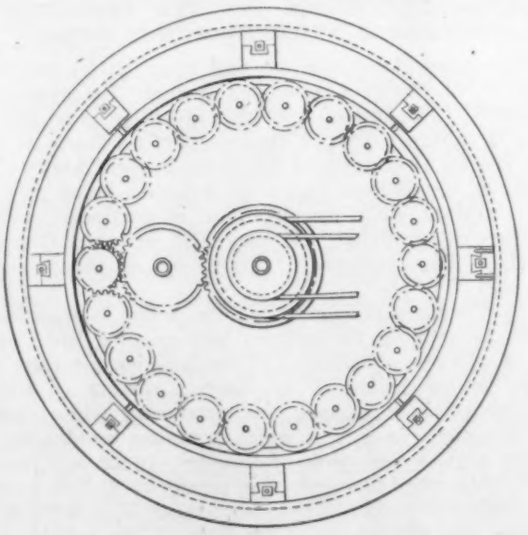


SECTIONAL ELEVATION.

If, for example, the case is to be made of brass, brass anodes are used; if of copper, copper anodes. Or, the cases may be built up of two or more metals; for instance, iron or zinc can first of all be deposited on the mandrel and then backed with brass or copper.

The electrolyte is injected under pressure on to the center of the case end or bottom, to insure the bottom, or what corresponds to the end of the case in which the cap is placed, being smooth and of equal quality to the remainder of the case. By this means it is possible to produce a cartridge case or other article with the bottom as smooth as, and of equal quality to, the remainder of the case, which would not otherwise be possible, as the copper near the axis of the mandrel which has a low peripheral speed would be unsound and useless for commercial purposes. The article after removal from the mandrel is drawn or spun down at the end to the desired form.

From the drawings it will be seen that the anode is formed in a ring, which is L-shaped in section, the lower limb serving to deposit metal upon the base of the cathode and the upright limb to deposit metal upon the broader portion of the side of the cathode. The metal for deposition upon the upper portion of the cathode to be subsequently drawn to form the neck of the cartridge is supplied by means of the upper portion of the anode which comprises a series of sections which together form a ring



PLAN.

enclosing the upper parts of the circular series of cathodes. These sections can be adjusted in position so as to obtain a different current density at this part than obtains at the lower part of the anode.

The cathodes or mandrels are secured to the lower end of spindles, the upper end of which carries a gear. These gears are arranged to be driven through an intermediate gear from a shaft in the center. This construction provides for the rotation of the mandrels.

HOW FELT POLISHING WHEELS ARE MADE.

Very little has been written relating to the methods and processes employed in the manufacture of felt polishing wheels, most manufacturers, for some incomprehensible reason, having maintained a policy of secrecy regarding their equipment and operations. As a consequence many buyers and users of polishing wheels have very erroneous conceptions of the manner in which they are made. An illustration of this is found in the wide-spread belief that felt wheels are moulded in forms and then put under heavy pressure to secure the necessary degree of hardness. That presses play but a comparatively small part in the wheel-making process as practiced in a modern plant will be clear from the following description of what was seen during the recent visit of a representative of THE METAL INDUSTRY to the Foot Manufacturing Company's plant, 32 to 40 Germania avenue, Jersey City, N. J.

This company is one of the largest manufacturers of felt, canvas and leather wheels, buffs, wire and bristle lathe and hand brushes in the world. It is housed in a substantial brick building with a frontage of 100 feet on Germania avenue, and extending through 200 feet to the next street. An idea of the magnitude of the operations carried on and of the heavy equipment employed may be gained from the fact that the power plant, installed at a cost of $10,000, includes a 250 horsepower Atlas four-valve engine, and a 250 horsepower boiler made by McEwen Brothers, Wellsville, N. Y., which is connected to a chimney 100 feet high, constructed by the Alphons Custodis Company.

The various departments of the Foot Company's plant are well systematized, the operations taking place as described below. The wool used in making the felt wheels is the best grade of Texas, Colorado, Utah, California or Territories clean white wool. No waste or shoddy is used. After being removed from the sacks in which it is received the wool is thoroughly scoured and then put through the picking machine, which "opens it out" and gives it an additional cleaning. It is then treated in the oil machine, a small quantity of oil being applied to the wool to facilitate its passage through the carding machines, and to reduce the amount of "animal electricity" carried in the wool. An excess of electricity makes the handling of the wool very difficult, this being more noticeable in cold weather, when it is often necessary to warm the machines before attempting to pass the wool through them.

After the oil treatment the wool goes through immense carding machines which distribute it evenly into thick loosely packed fluffy sheets which are wound into large rolls. The carding is an important step, as the perfect balance of the finished wheel depends to a great extent upon the even distribution of wool throughout the wheel.

The next step is to cut the sheets into circular sections, each of the proper diameter to make a wheel of given size when completed. At this stage the diameter of the circular piece is three or four times the diameter of the finished wheel, the reduction in size being accomplished by a process of shrinking. Before being subjected to this process, however, it is necessary to bring the material to a certain degree of hardness to hold the wool together and enable it to withstand the heavy manipulation it undergoes in the fulling machines. This hardening is done by apparatus designed especially for the purpose.

The fulling or shrinking machines are next employed, the wheels being put through them in batches. This is one of the most important parts of the whole process, as upon it depends the solidity and texture of the finished wheel. The fulling machines are very powerful and are constructed with a head having a reciprocating and turning motion. This exerts on the mass of partly completed wheels a peculiar kind of pressure that can best be described as a combination of kneading and squeezing. During this operation the wheels are saturated with steam, the process being very effectual in working the fibres of wool together into an absolutely solid mass, and in obtaining the uniform texture that is characteristic of a good wheel. The wheels remain under this treatment for a period of six to eight hours, during which the combined effect of the steam and the kneading shrinks them to approximately the diameter wanted in the finished wheel. The wheels come out of the fulling machine in a very hard condition, and are rinsed through several changes of clean water and placed in the drying house. At the proper time they are given what might be called a rough finish by subjecting them to sufficient pressure in hydraulic presses to make the two sides perfectly parallel.

The wheels are now ready for the finishing room where they are first passed slowly under a sandpaper roller revolving at 4,000 revolutions per minute, which cleans and smooths the sides to a perfect finish; they then go to the lathes where they are turned to an absolutely true circle and tested for balance. Previous to being turned any wheels requiring holes are put under a machine equipped with special cutters, and holes of the proper diameter quickly run through. Each wheel is then tested for soundness at a speed of 2,500 to 3,000 revolutions per minute.

In the plant described above the wheels are made individually; that is, they are not sawed or cut from large slabs of hardened felt, but are made and kept separate from start to finish, except that they are treated in batches in the fulling machine. The complete manufacture of a batch, from beginning to end, occupies from 10 to 14 days.

The Foot Manufacturing Company started in business about fifteen years ago, in a small way, and in the intervening time has built up a business of large proportions. A. H. Bogani is president, and A. R. Sampson is secretary of the company. Their felt polishing wheel department has a capacity of about 1,000 pounds of finished wheels per day. Wheels from 6 inches to 20 inches in diameter and from ½ inch to 4 inches thick are regularly made. The largest ever made by this firm, which they believe holds the record for size, measured 20 inches in diameter, 6 inches across the face, and weighed about 23 pounds each. The company also makes felt in sheets 36 inches square, from ½ inch to 4 inches thick, besides the other products previously referred to.

PRODUCTION OF LEAD IN 1907.

According to the United States Geological Survey advance report the production of lead last year amounted to 363,493 tons from domestic ores and 67,423 tons from foreign ores. The production of desilverized lead was 314,241 tons and of soft lead 99,948 tons, making the total production of refined lead 414,189 tons. Missouri produced 122,856 tons, Idaho 112,569 tons, Utah 61,699 tons, and Colorado 48,876 tons. All of these figures show a slight increase over the year 1906.

Consul H. Albert Johnson, of Liege, says that the official report shows that the Belgian mint was quite active during 1907, producing silver, nickel, and copper Belgian coins, as well as nickel pieces for Roumania and Colombia. In all 67,000,000 coins were struck off, having a value of $1,768,000.

INDUSTRIAL

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

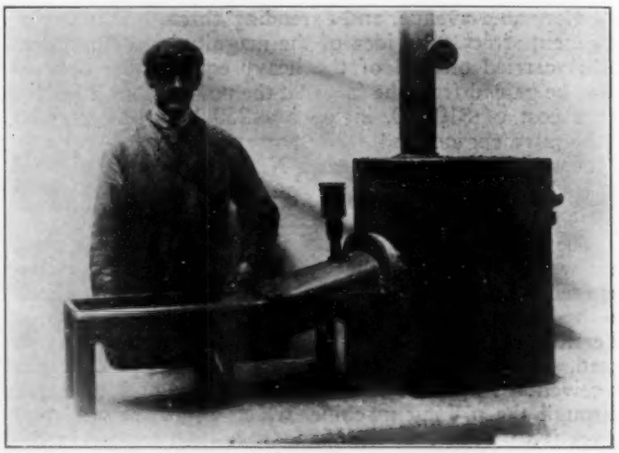
NEW FURNACE FOR JEWELLERS—REMARKS ON BRIGHT ANNEALING.

Among the various bright annealing furnaces brought out by the Bates & Peard Annealing Furnace Company, of Huyton, Liverpool, England (C. M. Dally, 29 Broadway, New York, American agent), is the new jeweler's furnace shown in cut. This company has been building for a number of years furnaces working automatically for the annealing of wire, metal goods, and even jewelry, but this furnace has been designed to meet the demand for a cheap machine to secure bright annealing where the output is too small to warrant the expense of an automatic feed chain conveyor type of furnace.

It is capable of annealing articles of any size which will go into a box 8" x 8" x 2" deep. To this box is fixed a long flexible handle for entering and withdrawing from the furnace the box containing the articles to be annealed. The furnace is cheaply fired by small coke fire.

In practice the operation is as follows: The heating chamber having been heated to the required temperature (to suit the metal to be annealed) and charged with steam from external supply, the articles to be annealed are placed in the box and same is carefully pushed through water to the bottom of water tanks, and hence rises up a gradual slope into the annealing chamber, a stop on the handle indicating the correct position and forming a scotch to keep box in correct position. When the articles have been sufficient time in heat to secure proper annealing, the box is carefully pulled down into the water to cool, and then withdrawn, this operation being repeated with each batch of metal to be annealed. The machine is provided with steam inlet and safety valve outlet, and sight hole for watching the temperature.

We now wish to write a word or two of what the Bates and Peard people are accomplishing in the industrial world, and a line or two about the personnel of the company. Their furnaces have been described in THE METAL INDUSTRY a number of times, having been first noted in our issues of 1904. In brief, the process of softening metals is accomplished by conveying them through an air-tight chamber sealed at each end by water, the chambers being located over a heating furnace, and the metals practically annealed in steam. The furnaces are the direct results of the inventors' experience in a wire works, they having taken hold of the problem of bright annealing at the wire works in which they were employed.



NEW JEWELER'S FURNACE.

USERS OF BATES & PEARD FURNACES.

ENGLAND.

No. of Retorts.	Used on.	Users.
5	Copper Wire	British Insulated & Helsby Cables, Ltd., Prescot, Lancs.
5	Bronze, Gold and Coinage	Royal Mint, London.
3 double, 1 single	Small Arms Ammunition Cases	Royal Arsenal, Woolwich.
3	Small Arms Ammunition Cases	Messrs. Kynoch Limited, Birmingham.
2 double	Small Arms Cases and Brass Tubes	Messrs. The Birmingham Metal & Munitions Company, Birmingham.
1	Brass Wire	Messrs. Geo. Christie Ltd., Glasgow.
1	Jewelry	Messrs. G. H. Johnstone & Co., Birmingham.
1	Brass Stampings	Messrs. Hipkiss & Company, Birmingham.
1	Jewelry	Messrs. Manton & Mole, Birmingham.
1	Jewelry	Messrs. W. H. Rabone & Co., Birmingham.
1	Jewelry	Messrs. Henry Owen & Son, Birmingham.
1	Jewelry	Messrs. W. H. Wilmot & Co., Birmingham.
2	Plated Metals	Messrs. Samuel Taylor Ltd., Birmingham.
1	German Silver Alloys	Messrs. Wiggin & Company, Birmingham.

UNITED STATES OF AMERICA.

1	Copper Wire	American Electrical Works, Phillipsdale.
3	Copper Wire	American Steel & Wire Co., Worcester.
1	Alloys	Driver Harris Wire Co., Harrison.

1.....Jewelry .....Messrs. Krementz & Co., Attleboro.
2.....Copper Wire.....Wire & Telephone Company, Rome.
2.....Copper Wire.....Spargo Wire Company, Rome.
4.....Copper Wire.....W. A. Clarke Wire Company, Newark.
1.....Copper and Brass..Coe Brass Company, Ansonia.
4.....Copper and Brass..Detroit Copper & Brass Co., Detroit.
2.....Copper .....Standard Underground Cable Co.
1.....Copper .....Diamond Rubber Company.

CANADA.

1.....Copper Wire .....Dominion Wire Company, Montreal.

INDIA.

2 double...Rupee Coinage.....H. M. Mint, Calcutta.
2 double...Q. F. Brass Cases..H. M. Arsenal, Cossipore.

FRANCE.

2.....Copper Wire.....Establishment Mouchel, Paris.
1.....Bronze Coinage....French Government Mint, Paris.

ITALY.

1.....Copper Wire .....Societa Ligure Ramifera, Genoa.

GERMANY.

Patents sold outright to the following firms .....Die Allgemeine Elektricitats Gesellschaft, Berlin.
Die Oberschlesische Eisenindustrie A. G., zu Gleiwitz.
Die Firma Emaillirwerk Metallwaarenfabrik Silesia, zu Berlin.
Die Firma Carl Berg, zu Eveking.

BELGIUM.

Patents sold outright to .....Societe Anonyme des Usines a Cuivre et a Zinc, Liege.

DENMARK.

Copper Wire .....Die Aktieselskabet Nordiske Kabel-og Traadfabricker, Copenhagen.

RUSSIA.

Copper and Brass Sheets .....Societe de l'Usine a Cuivre et a Tubes, St. Petersburg.

AUSTRALIA.

1.....Gold Coinage .....H. M. Mint, Sydney.

JAPAN.

1.....Sheet Metal for Coinage .....H. M. Japanese Mint, Osaka.
1.....Copper .....The Sumitomo Copper Works Company.

Now a word or two about the inventors, Darwin Bates and George Wordsworth Peard, both of whom are respectively employed as works manager and wire mill manager of the British Insulated and Helsby Cables, Limited, situated at Prescot, eight miles from Liverpool, and the largest cable works in Great Britain. With their official positions at this plant Messrs Bates and Peard have had the opportunity of studying annealing problems, and their several types of automatic furnaces are the result. The furnaces, like most of the machinery at the cable works, are built at the plant and any changes in the design are made according to the trade requirements. While most of the industrial works of England have, like in America, been quiet for the past ten months, this cable works has been busy, running day and night most of the time. All their wire work is in metals, they manufacturing nothing in iron and steel. The total capacity is 8,000 tons per year.

The annual report of the Mint, Birmingham, has just been issued, showing a net profit of £23,872, from which it is proposed to pay a 10 per cent. dividend, with a bonus of 5 shillings a share, placing £10,000 to reserve, making that fund £110,000, and carrying forward £5,865 to next year. It is reported that the works have been very well employed throughout the year.

NEW SAND BLAST NOZZLE.

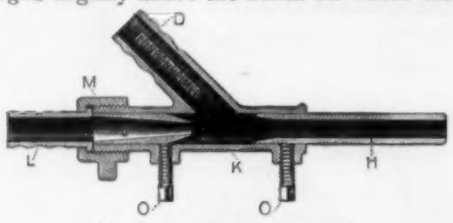
The Lunkenheimer Company, of Cincinnati, O., have just placed on the market an improved sand blast nozzle, engravings of which are here presented. Although particularly adapted for cleaning castings, this device can be applied to quite a number of uses, such, for instance, as removing paint or stains from metal or wood, frosting glass, sanding metals, especially brass, etc.

It is very evident that in all sand blast nozzles the great wear comes upon the extremity of the nozzle itself and the tubes leading to it. In the present instance this difficulty is overcome by means of the special hard composition of which the tubes are made. The company call attention to the internal shape of the air tube J; they have found this particular shape not only lends more force to the blast, but it affects quite a saving of air.

The body K, tailpiece L and union M are made of a very high grade bronze. The wearing parts, namely, the outlet tube H and air tube J, can readily be renewed when worn, at a small expense.

From 60 to 100 pounds air pressure should be used to obtain best results, and the tubes H and J should be regulated to suit the pressure. This is easily accomplished, as the tubes are simply held in place by the set screws O. The higher the pressure, the closer the tubes should be placed together.

The perspective view shows a very convenient arrangement of the apparatus for cleaning castings. A hood A is arranged slightly above the bench on which the cleans-



SECTION THROUGH NOZZLE.

ing is done, to which hood is connected a suitable pipe, which carries off the dust and dirt that would otherwise soon fill the room and make it intolerable for the attendant. The sand that is carried off through the suction pipe can be used over again. Suspended from the ceiling

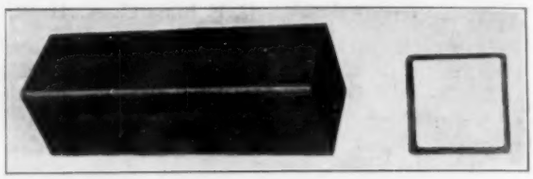
CLEANING CASTINGS.

in any suitable manner is a reservoir B for the fine sand used. This reservoir is connected by a flexible hose C to the nozzle D, to which the sand feeds by gravity. Connected to the removable tailpiece L, of the nozzle, is a hose F leading from the compressed air supply. A valve G is provided, whereby the air may be turned off or on, as desired. This arrangement can cheaply be installed and the benefits derived will soon pay for the cost.

August 25th marked the 13th anniversary of the distribution of power by the Niagara Falls Power Company. On August 25, 1895, the company fulfilled its contract to furnish the Pittsburg Reduction Company, now the Aluminum Company of America, with sufficient power to operate the immense plant on Buffalo avenue. On October 19 of the same year the power company supplied its second tenant, the Carborundum Company, with power. Power House No. 2 was built in 1900, with the view of generating 50,000 horsepower, which was good enough for those days, but the growth of the city of Niagara Falls to three times its size in 13 years necessitated a second power house, capable of furnishing 55,000 horsepower. Buffalo was supplied with power from the Falls in November, 1896.

SQUARE STEEL TUBING.

Brass bed manufacturers, car builders and other users of tubing will be interested in the new low-priced brazed square steel tubing recently put on the market by the Phenix Tube Co., Brooklyn, N. Y. Heretofore the use of square tubing has necessarily been limited by the comparatively high price of the seamless product. The new brazed square tubes are sold at a price but little higher than that of round tubes and the makers confidently expect that their introduction will result in an extensive substitution of square tubes for round in the

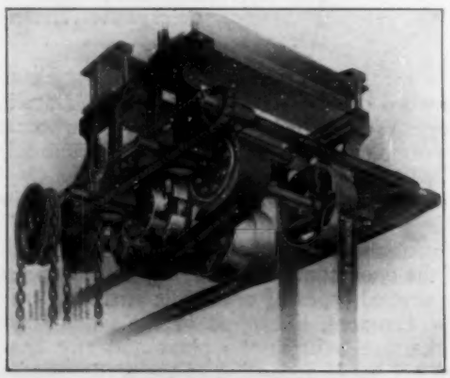


SQUARE STEEL TUBING.

manufacture of brass beds, metal furniture, car rails, ornamental work, and in similar lines. The Phenix company is prepared to make quick shipment of all sizes from ½ inch to 1½ inches square, and within a few days will also put on the market a 2-inch square tube. They also manufacture brass and bronze-lined iron tubes, steel-lined brass tubes, and many standard, special and bent shapes of brass tubes. They carry in stock about two million feet of various kinds and sizes of tubing.

THE S. & S. VARIABLE SPEED COUNTERSHAFT.

The variable speed countershaft manufactured by the Rotary File Machine Company, of 589 Kent avenue, Brooklyn, N. Y., consists of an arrangement of expanding belt operating pulleys by means of which any variable speed relationship desired within the limits of 4—1 can be maintained at its maximum. The adjustment can be



S. & S. VARIABLE SPEED COUNTERSHAFT.

made almost instantly. The gear is made in 14 standard sizes, capable of transmitting up to 128 horsepower.

The variation in the diameter of the expansion pulley is effected in the following way: It will be noticed that the rim is divided into 12 sections with two spokes riveted to each. These spokes slide in machined slots inside a cast-iron hub. Part of each spoke inside the boss has teeth milled on one edge and all are in mesh with a broad pinion. This pinion is operated by an inner shaft which is only capable of longitudinal movement, but owing to grooves being milled on the one end of this inner shaft, any movement given to same rotates the

aforesaid pinion inside the hub drawing the spokes in or forcing them out according to the direction of motion given to the hand wheel, which operates both of these inner shafts simultaneously.

THE 20TH CENTURY MOLDING MACHINE.

By J. F. Webb.

My object when I got up this machine was to get a portable power machine to do general railroad repairs.

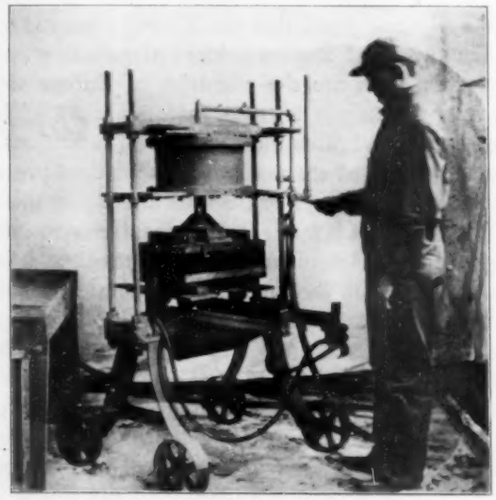


FIG. 1. RAMMING UP DRAG PART OF FLASK WHEN SAND MATCH IS USED.

There were at that time several hand power portable machines, but no portable power ones. It was also my aim to get a machine that would not require patterns to be

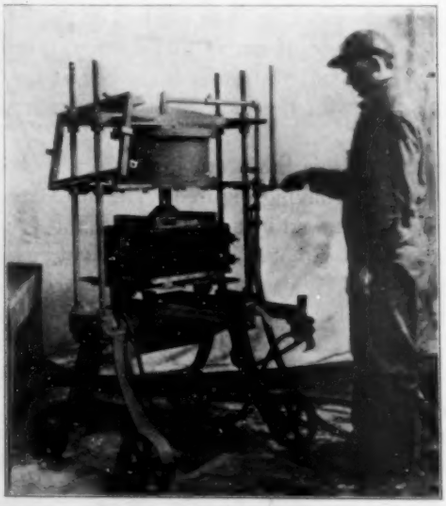


FIG. 2. RAMMING COPE OF FLASK WHEN SAND MATCH IS USED.

changed in order to make them on a molding machine, as pattern work is very expensive and requires time to make the changes.

This machine is specially adapted for general jobbing foundry work or specialty shop, and patterns that were formerly molded by hand can be used without any changes being made.

The first cut shows the drag part of the flask being rammed up when the patterns required sand match, which is placed on a small car which runs very easily on roller bearings. The drag part of the flask is put on and a sand frame, 1 inch deep, is placed to hold the extra sand needed to fill the mold. The board is placed on and the car and mold are pushed under the cylinder. The air is turned on and the mold is rammed by the piston coming down on the pressure head. The cylinder is 13 inches in diameter and gives a positive pressure of nearly 7 tons

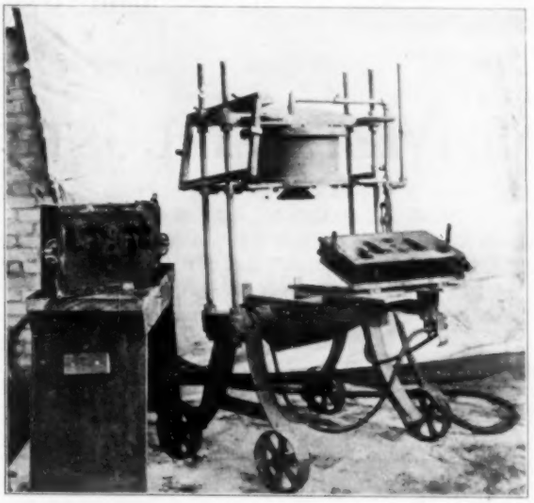


FIG. 3. FINISHED MOLD, READY FOR CORES, CASTING LOCOMOTIVE CHECK VALVES.

with an air pressure of 100 pounds. The mold is then pulled out from under the cylinder, the pressure head removed, the extra sand struck off, the bottom board put

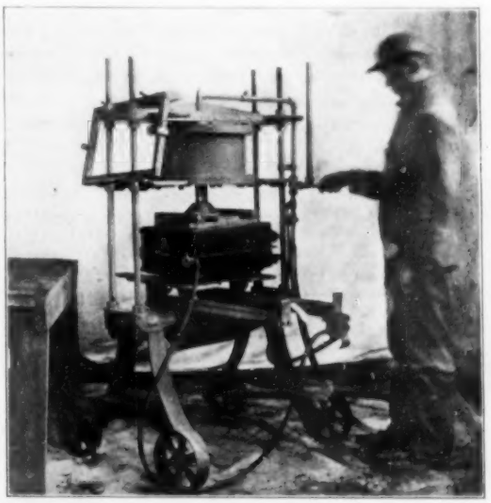
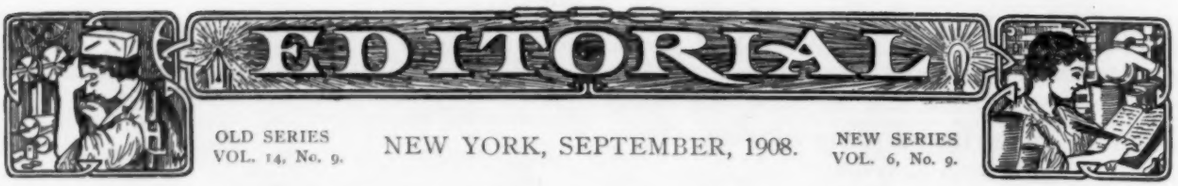


FIG. 4. RAMMING BOTH COPE AND DRAG AT ONE OPERATION, WHEN PATTERNS ARE MOUNTED ON A BOARD.

on and the whole rolled over, when the cope is rammed in the same way as the drag.

The hardness of the sand can be regulated by raising or lowering the cylinder by the nuts of the side rods. Cut No. 2 shows ramming the cope; cut No. 3 shows the mold finished ready for cores; these castings are brass locomotive check valves; cut No. 4 shows the machine ramming both cope and drag at one operation. This can be done when the patterns are mounted on a plate or board. In this case a plate is used with vibrator attached to the plate. A stripping plate can be used with this machine to very good advantage for such work as valves or car brasses.

This machine is built by the J. F. Webb Manufacturing Company, of Davenport, Iowa.



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MANUFACTURING UNDER ENGLISH PATENT LAW.

It is well understood that the United States is vastly more liberal toward foreign holders of patents who seek its protection than are the countries of Europe toward Americans who take out letters patents abroad. This is especially true as regards the operation of inventions, and particularly as to where and when the article protected shall be actually produced or manufactured. On this subject our own patent law is silent; it manifests no interest whatever in the place of manufacture, nor does it interfere in any way with the time of manufacture. One who holds a United States patent, whether he be citizen or foreigner, can make it anywhere he may select as being of the most advantage for himself, and sell it wherever he can find a market. Our Government is not interested in the matter. After the granting of the patent he may select his own time for introducing it, or he may lock it up and keep it as a menace to flash, at some future time, before would-be competitors. The authorities are indifferent as to what he does with his invention.

But the case assumes another aspect when we go across the water, and particularly when we examine the operation in Germany and England. In Germany the patent, to remain valid, must be worked or put into actual use, both in the case of native and foreign inventors; it cannot be hidden and yet retain life. But at the present time it is more with the new British law that we have to do.

On August 28 this law went into effect, the one year of grace provided having expired. The act states that a British patent, taken out by a non-resident, must be actually manufactured in Great Britain, or it cannot be marketed in that country. This means that a patent owned by a foreigner cannot be sold in that country unless made there. Unlike the German law, this law has no effect upon patents taken out by citizens, who can manufacture where they please.

The law is aimed especially at German and American inventors, who have for years manufactured in their own country and sold without restriction in England. England, therefore, derived no benefit from these inventions in return for the protection granted by the patent office. Industry was not stimulated and the expense of production was incurred abroad to the injury of the home workman.

The British law provides that every patent issued to a foreigner must be worked or commercially produced in the country, or become void. Provision is made so that for adequate reasons the limit of time may be extended for a reasonable period. But the main point is that the invention must be produced in Great Britain,

actually made in an English shop, or in one conducted by the handling concern. So far the direct result has been that many American companies, having large business relations with England, and to whom the new law applied, have already established plants in that country and are actually producing their goods there instead of here. As yet the movement has not affected our mechanics to any considerable extent, but it must in time have an influence which will be sure to demand something in the shape of a remedy.

It is very probable that the incoming Congress will consider the matter, since it will be brought so forcibly to the attention of the lawmakers as to compel their serious thought. At present in the United States the foreign patentee is placed on precisely the same footing as the inventor born here; we make absolutely no distinction, while all the countries of Europe which grant protection of any value discriminate in favor of the home inventor. It has been advanced that since we can produce cheaper, with our skill in designing and trained mechanics, it makes no difference, as we can always meet foreign competition. That may be, and probably is so with reference to the home market, but when we are compelled to take the wages account out of our own country the matter assumes another and more sober aspect. The wages have gone, in this instance, to Great Britain, and most likely will never return. We can, and most likely shall, pass similar laws, so that we shall be on a more even footing with foreign countries.

SHORTCOMINGS OF THE BRASS FOUNDRY.

Elsewhere in this issue we present under the caption "The Brass and Bronze Industry," a very severe arraignment of the things that are not done, and that should be done, and that must be done eventually, in the brass foundry. We say "severe" for the reason that word aptly describes the matter, but the largest portion of the severity arises from the fact that the indictment is based upon truth and is not a mere recital of things that may or may not be so.

Why the majority of brass foundries should so tenaciously cling to rule-of-thumb methods, especially when having the example of the same industry in iron, is a riddle vastly more inscrutable than that of Solomon. The article contains something pertinent about purity of prime metals, the melting furnaces and crucibles, the books we need, and the work to be done by the colleges. But it is not with all these we have to do just at present.

We believe the all-important requirement of the brass and bronze founder of to-day is the chemist. Unfortunately, and for some mysterious reason, the chemist is regarded with suspicion. In a few instances he is admitted, but he must work in a closet, with scant and inadequate appliances, and always under the conviction that neither his position nor himself is worthy of respect. In very rare cases the chemist occupies an honored place on the staff, his advice is sought and his opinions and recommendations are treated with care. Under these surroundings—and this is the vital question of the whole problem—he has proved to be one of the most important equipments of the plant, whether considered from the manufacturing or commercial end of the business.

Prime metals and scrap are purchased; they are mixed in a more or less promiscuous fashion with the hope that the castings will turn out all right. We wonder how many founders have even an approximate idea of the composition of the castings made in this way; and yet this method is the rule and not the exception. A certain grade of metal is called for and the founder guesses as near as he can, always depending upon his experience when he did something about the same in the dim past. Of the actual condition of his raw materials and of his products he knows nothing with even a trace of accuracy. As long as his customer will accept the goods and pay for them he is satisfied; beyond that the transaction has no interest for him.

This condition will change in time, and we think the most potent influence now working toward better work in the brass foundry is the specification. It has become very general in the iron and steel trade to specify what a casting shall analyze, and this custom is now edging its way into the brass industry. In the latter case the railroads are very largely responsible, since they demand for their brass work that it shall be of a known composition, and from this they will permit no wide variation. Large consumers are following the same course, the result being that the brass and bronze founders are being forced to equip their plants for the more accurate testing of their raw materials and for the better handling of those materials.

Another industry which is exerting a marked effect in this direction is the electrical. Here the output of the brass manufacturer must not only have prescribed physical characteristics but it must also meet stated electrical requirements. The founder attempting work of this kind without having the assistance of a chemist has but a very poor chance in the running, and if he should land a contract it would be a miracle if he made enough to cover his cost charges. But his competitor, having a trained analytical chemist in his plant, would assume the contract without fear and would be certain to make a balance on the right side.

THE U. S. STAMPING ACT.

This act has now been in force nearly eighteen months. Our readers are familiar with its provisions. Its main aim was to place some check on the making and selling of falsely marked articles composed of silver or gold. It sought to protect the ignorant purchaser against the wiles of the crafty and unscrupulous dealer. Many of the States have passed laws along lines identical with the Federal act.

But our Solons might just as well have been engaged in some other pursuit. They would have accomplished an equal amount of "protection for the ignorant" if they had sent a nice little circular to every dishonest jeweler respectfully requesting him to "Please be good." We have heard of no convictions under this law. We have heard of no grand rally of fraudulent manufacturers anxious to change their methods. We have heard of no sigh of contentment from the poor, ignorant public who no longer buy flash gilt thinking it the pure stuff. We hope we have been asleep and shall wake up to find the law has provided a panacea for all the ills of the jewelry trade; but we trust we are not of those "who listen with credulity to the whispers of fancy, and pursue with eagerness the phantoms of hope."

CRITICISM AND COMMENT

WE CORDIALLY INVITE READERS' OPINIONS AND CRITICISMS OF ALL ARTICLES PUBLISHED IN THE METAL INDUSTRY. SUGGESTIONS WELCOME.

CLEANING NICKEL ANODES.—DO NOT DO IT.

To the Editor of THE METAL INDUSTRY:

I have read with interest the article on "Cleaning Nickel Anodes," by B. W. Gilchrist, in your issue for August. I desire to substantiate the statements he has made. In my experience I have come to the same conclusion and I find it unnecessary and unsuitable to clean or brush nickel anodes.

Inasmuch as all large supply houses both in this country and in England, and the books and technical journals recommend and emphasize the necessity of keeping nickel anodes clean, it is high time that this unnecessary and harmful procedure should be discouraged.

I have always obtained the best results when leaving the anodes unscrubbed. This I believe is due to the nickel molecules with which the nickel mud surrounding the anode is impregnated. This loose nickel is more susceptible to the current and to electrolytic action going on in the bath, and tends to keep the solution in a normal condition. The best part of the anode is lost and the solution is impoverished.

I have always found that with new or clean anodes the solution has a tendency to deposit a steel color and unless conducting salts are added it will remain so for several days, or until the anode has been acted upon by the sulphuric acid of the solution.

Southington, Conn. EMANUEL BLASSETT, JR.

CLEANING NICKEL ANODES—DO IT.

To the Editor of THE METAL INDUSTRY:

In the August issue of THE METAL INDUSTRY an article by B. W. Gilchrist on Cleaning Nickel Anodes attracted my attention owing to the off-hand manner with which the subject is treated. The author does not appear to realize that the question of nickel anodes should be handled with the utmost care and with careful consideration of all the details.

In the first place "nickel anodes" may mean anything or nothing, as experienced platers recognize at least four kinds; namely, pure rolled and pure cast anodes, and ordinary rolled and cast anodes (the two latter containing approximately 91% nickel and 7% iron, the remainder being impurities).

It is a well known fact that pure and impure anodes act differently in nickel solutions and that the latter become covered with a reddish brown film of basic iron salts. This film is certainly objectionable from the fact that it adds to the undissolved impurities in the solution. The ordinary method of scrubbing where the anodes are cleaned with a stiff bristle brush is entirely satisfactory in every way and does not materially affect the surface of the anode.

I agree with Mr. Gilchrist that new anodes do not act as well as old ones, owing to the smooth surface and depending on whether or not they are cast in iron or sand molds, but this trouble only occurs with cast anodes and these anodes after a time give excellent results, even when used immediately after scrubbing. It also seems to me that a careful study of conditions other than clean anodes would help Mr. Gilchrist in his troubles with basket plating.

A totally erroneous idea common to most platers is that the black deposit sometimes observed on cast anodes is carbon. The proportion of carbon in nickel anodes, furnished by most dealers, is very small and the black deposit can easily be identified by any chemist as nickel oxide and not carbon. This fact should be considered by Mr. Gilchrist who has advanced H. J. Hawkin's (The Polishing and Plating of Metals) theory of local battery action depending on the presence of carbon. The black nickel oxide is objectionable on anodes owing to the fact that it is less soluble than nickel and therefore the anode efficiency is decreased. Of course, all of these solubilities are dependent on the reaction of the solution, an acid solution is more liable to aid the formation of this oxide while an alkaline solution prevents it. In a slightly acid or neutral solution (as all good nickel solutions should be) where the anodes are cleaned three or four times a month it will be found that this oxide forms only to a slight extent and the anode efficiency is very high. By properly proportioning the rolled and cast nickel anodes a nickel bath can be maintained perfectly neutral, the anodes corrode readily, and the solution will have a high rate of efficiency.

I strongly advise against any plater making a comparison between new nickel anodes and old uncleaned anodes, as suggested by Mr. Gilchrist, as he will obtain erroneous results. Let him take an uncleaned anode and an old anode which has been cleaned and, using them under proper conditions, make his comparison. He will find by weighing the anodes before and after plating (after using for some weeks) how much better one anode dissolves than the other. In making comparative anode tests a careful selection of anodes should be made, from the same lot, as the way in which anodes are cast has important bearing on their solubility. By using anodes from the same lot the experimenter is reasonably certain of eliminating the error due to difference in castings.

The modern, up-to-date plater believes in clean solutions, clean contacts, and clean anodes because experience has demonstrated that by such conditions he can obtain the greatest uniformity and the highest rate of efficiency from his plating baths. A well managed plating establishment has all cathode rods cleaned daily, anodes scrubbed once or twice a week, solutions filtered twice monthly (at which tmie the tanks and all contacts are thoroughly cleaned). Under such conditions the plating bath will almost run itself.

PERCY S. BROWN.

New York City, August 31, 1908.

Zinc dust, which is made by smelters as a by-product, being the vapor of zinc escaping from the condensers, is produced to some extent in this country, but by far the larger part comes from Germany. It is extensively used in the cyanide process for the precipitation of gold, and is also used in the paint and other industries. A new use for the oxide is in the protection of metals (steel and iron particularly), according to the Sherardizing process. In large quantities zinc dust sells for a little less than spelter.

CORRESPONDENCE

IN THIS DEPARTMENT WE WILL ANSWER QUESTIONS RELATING TO THE NON-FERROUS METALS AND ALLOYS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

METALLURGICAL.

Q.—We are at present experiencing quite a little difficulty with coke slagging in the cupola. Does the distance of the blower from the cupola have any bearing on this? Our blower is 10 feet from the cupola.

A.—A heavy blast would, of course, have a tendency to increase the slagging action, but it is not likely that the location of the blower is the cause of the trouble. Some of the West Virginia cokes have such a fusible ash that after the cupola bottom is dropped the unburned coke is matted together to such an extent that it has to be pried down with bars. If you are not able to get a good hard coke, you can get a clean drop by adding a small amount of limestone to the bed and also to each charge.—J. L. J.

Q.—(1) We wish to produce a high grade bronze casting in heavy valves, fittings, etc., as hard as can be machined with high speed steel and at the same time very tough, but not brittle. We have used a great many copper-tin alloys containing tin and phosphor-tin contents up to 15 to the 100 pounds of copper, and have also introduced manganese copper and nickel, but have thus far been unable to produce castings having the required toughness and hardness. The castings must be acid-resisting. (2) In phosphor bronze alloys what proportion of the tin should be phosphor-tin?

A.—(1) Hydraulic metal, which consists of copper 100, tin 10, and yellow brass 25, is very tough, hard and non-corrosive, and if properly made can be recommended for the purpose you mention. It must be first cast into ingots and then remelted in order to make it dense, close grained and able to resist corrosion. Most manufacturers make heavy valves from copper 88, tin 10, and zinc 2. Mix by melting 40 pounds of copper with 10 pounds of tin and cast into ingots. Melt this hardener and the remaining 48 pounds of copper together, add the zinc, then pour into ingots. Remelt and just before pouring into castings add to the crucible 2 ounces silicon-copper for each 100 pounds of the mixture. See that you get a well mixed, dense, close grained metal and it will be superior to any mixture containing manganese, nickel or phosphorus. (2) The proportion of tin and phosphor-tin that should be used in phosphor bronze alloys depends on the nature of your copper and the requirements of your customer. With good ingot copper only a trace of phosphorus (just enough to show when the metal is melted) is really necessary. Scrap wire requires much more, at least ¼ per cent. of phosphorus. If you have to make castings to meet a specification of 0.8 per cent. phosphorus, you would have to use metallic phosphorus or 15 per cent. phosphor-copper, because you could not add that much if using 5 per cent. phosphor-tin.—J. L. J.

Q.—We want to put a new floor in our brass foundry. Our work is of a light nature, molding machine and bench work. What will make a good floor?

A.—A cement floor will prove the most satisfactory. It is not burned out when metal is spilled on it as is the case with wood. It can be kept clean, as there are no cracks or joints for sand and metal to get lodged in as with brick and wood floors. Plates and grating should, of course, be used around the furnaces.—J. L. J.

Q.—We are having considerable trouble with our castings, pump chambers and rods, which are largely in use for mine work and in contact with mine water. We would like a good formula which will resist the water. Sulphuric acid seems to be the destructive element.

A.—The following mixture resists mine water very well and can be machined without the tools chattering:

Copper	100
Tin	17
Lead	3

We think this mixture will answer your purpose.—J. L. J.

MECHANICAL

Q.—What is the best shape, grade and grain wheel for general tool grinding?

A.—In answer to the above, grinding wheels are made of corundum, emery and carborundum; and manufactured of many different numbers or sizes of grain, and also of many different degrees of hardness to meet the great variety of conditions under which they are used. The term grade as applied to wheels to designate the degree of hardness is the resistance of the particles to the pressure employed in the act of grinding. A wheel from which the particles are easily broken is called soft, while one which retains its particles longer is called hard. Wheels are graded from soft to hard; the grades being denoted by the letters of the alphabet. Different grades of wheels are obtained according to the amount of bond employed, the wheel becoming harder as the amount of bond used increases. The grains of abrasive materials are numbered according to the number of meshes per square inch of the sieve through which they have passed; *i. e.*, No. 20 is a grain that will pass through a sieve having 20 meshes to the square inch, but will not pass through a sieve having 30 meshes. Abrasive materials are crushed into grains numbering from 6 to 220, 6 being the coarsest and 220 the finest. There are seven different ways of cementing or binding the granular material into forms and shapes convenient for grinding purposes, designated as vitrified, silicate, celluloid, vulcanite, asphaltum, shellac and tanite processes; the vitrified is adopted as the most scientific and efficient as in it the binding material employed is in itself a fairly good abrasive whereas with the other six processes, substances are employed which are decidedly injurious to the wheel in some cases causing a gumming, or glazing, and in others, a softening when exposed to moisture. Therefore past practical experience has taught that carborundum being insoluble in water, oils, or acids, absolutely infusible, extremely hard and sufficiently brittle to permit of its breaking into sharp, angular particles is an ideal material for grinding as the weight of emery is about twenty-eight per cent. greater than that of carborundum, a matter of great importance when considered in connection with the high speed at which they are to run. The breaking strain being proportional to the weight, care should be exercised that the wheel is balanced; this is an important considera-

tion both as regards the safety of a wheel and its capability of doing good work.

The manner of mounting has much to do with the safety of wheels, it should slide on the spindle rather loosely, sufficiently close not to wabble, but under no circumstances must it be forced.

A wheel that has been forced on the spindle may burst as the direct result of the expansion of the lead bushing produced by the heating of the shaft from a warm bearing. Before mounting it should be lightly tapped with a hammer; if it does not ring with a clear tone, it is cracked and should not be used.

The cup or cylinder wheel with a guard over the outside so that no part of the wheel but the face can be ground on makes the ideal shape as the wheel always has a straight grinding surface. For a good clean cutting wheel for general tool grinding try carborundum cup-wheel 12 ins. diameter, 1½ in. face, grain 30, grade "M," to travel 1,300 revolutions per minute. E. W.

CHEMICAL

Q.—I had a formula for etching from rubber type something like this: A mixture was made to resist the acid, but by dipping the rubber stamp in a strong lye or potash it cut through the acid resisting mixture, making it ready for the acid. Please suggest anything that will help me in this direction.

A.—Your formula probably consisted of gum copal cut down with acetone and a little aniline blue or violet added to color the varnish. This would resist the acid. A strong solution of lye applied in the manner mentioned would reduce it so that the acid would bite sufficiently.—C. P.

Q.—I want a brass dip without the use of any current. The articles are made of fine steel and I must coat them without using a solution.

A.—There is no successful method of coating steel articles with brass except by dipping. There are lacquers made to give articles of iron a brass color by dipping, but this is usually accomplished upon a tin surface. If you get some fine brass dust and could tumble the articles you might possibly get a brass color, but a brass solution would be the most economical.—C. P.

Q.—I would like a finish for old brass.

A.—For your purpose the following formula can be used. Dissolve 10 ounces of white arsenic in 6 ounces caustic soda and 1 gallon of water. Then add ½ ounces cyanide to each gallon of the solution. Use this as an electro-plating solution with iron anodes. A good, strong current should be used. Upon polished surfaces a good black can be produced that is very satisfactory for antique and old brass finish. When dissolving the arsenic and soda take about 1 quart of the water and use this nearly boiling.—C. P.

Q.—We want to plate iron buckles bright. The work must be done in quantity in a mechanical outfit, which we have.

A.—There are two methods whereby a bright finish may be obtained mechanically. The first is to free from grease by tumbling in sawdust; then retumble in macerated leather or leather meal, using a little powdered nickel rouge to assist in the polishing. Cleanse and nickel in the mechanical plating tank. If the solution is in good working order the articles should come out as bright as the sample you send. If not, it will be necessary to retumble after nickeling. This can be accomplished with the leather meal and a little rouge, or by using mall steel balls same as are used for bearing purposes. When articles are tumbled in borax water with steel balls a burnished appearance is the result.—C. P.

Q.—Enclosed we hand you a loop which we think was not made in this country. The finish is attractive to us and yet we are not able to determine just what it is and how it was done. We shall appreciate any assistance.

A.—From experiments made with the sample loop submitted we are of the opinion that this is a deposit of black peroxide of lead produced by a reversed current of 4 to 5 volts, using a solution consisting of 4 ounces of caustic soda and ½ ounce acetate of lead dissolved in 1 gallon of hot water. This is allowed to cool and the solution decanted. Strips of copper should be used as cathodes, and the articles placed in the center of the tank as in the regular plating bath, only the process is reversed. The color produced is a dark blue black. After this is obtained the articles are dried out and polished on soft buff wheels when the beautiful gun metal finish will develop. The articles must be chemically clean as for plating. Your sample was refinished in the manner mentioned. —C. P.

Q.—There is something the matter with my nickel solution. If I clean a piece of work and put it in awhile—say 15 minutes—with low current, it is all right. But if I put in a tank full of work and let it alone for 30 to 45 minutes with a little more current, the work peels.

A.—Your trouble results from too much acid and ammonia; which combination gives you free ammonia sulphate in excess and your resulting trouble is the same as would be the case in a cyanide bath with a large excess of free cyanide—a consequent peeling of the deposit due to the excess of gas produced upon the articles. The best method for you to pursue would be to reduce your solution to 5½ Baume with water and then add from 2 to 3 ounces of single sulphate of nickel. The solution removed from the bath should be saved and again added to the bath as required to reimburse it.—C. P.

Q.—In your first issue of Volume 6, page 29, you give a formula for producing a Barbedienne Brown. We have followed these instructions very carefully and the result is a brown, but it is all mixed up with rainbow colors. This does not show so much on round shells or tubing, but shows plainly on square shells and 2-inch square tubing.

A.—Your trouble is probably due to too thin lacquer. Brown colors of this description need a heavier lacquer to overcome the iridescent colors produced upon this finish. Add at least 1 pint of French white copal varnish to each gallon of lacquer; this will increase the body and should do away with the colors mentioned.—C. P.

Q.—Please give us a formula for brass routed or etched signs that will give a tough glossy filling that will last.

A.—Melt 8 ounces of coal tar and then add 1 ounce beeswax and 4 ounces rotton stone. Make this into sticks or slabs and apply to the heated metal surface, removing the excess in the usual manner when hard and cold with emery cloth, and finish with pumice stone and oil for a dead lustre. For bright lustres polish in the usual manner by applying a coat of lacquer to the polished surface of the filled letters.—C. P.

Q.—Will you give us a formula for a solution that will give the best results for plating zinc with nickel, one that is practical to use in 75 to 100 gallon solution and turn out work in quantities. We have at our command 6 volts and 1,000 amperes.

A.—The following formula has been highly recommended for nickel plating zinc:

Chloride of nickel	2½ lbs.
Chloride of ammonia	2½ lbs.
Water	5 gallons.

Dissolve the salts in warm water. If the bath is acid to test paper, namely blue litimus, add a very little ammonia water, after which it is ready for use. Use a current of low tension, not more than 2 to 2½ volts as the bath deposits very rapidly. In nickeling zinc it is advisable to maintain a small striking solution with a much stronger current than used in the regular bath. This may also contain a slight excess of chloride of ammonia.—C. P.

Q.—Please advise us whether aqua regia has any effect on brass. We understand this is the only liquid that will dissolve gold.

A.—Aqua regia, when cold and free from water, has very little action upon brass, unless immersed for some time. It is the only practical reducing agent for gold. —C. P.

Q.—I would like to know how to make a gun metal finish on polished brass, or a lasting bright black finish.

A.—For a good bright black finish upon polished brass prepare a solution as follows: Dissolve 8 ounces of powdered white arsenic and 4 ounces 98% caustic soda in as small a quantity of boiling water as possible. When dissolved add 1 gallon muriatic acid and 8 ounces single sulphate of nickel; mix thoroughly. Use in the solution anodes of cast nickel. The voltage should be 3 to 4 with a small amperage. Clean the articles in the usual way, flash for a few seconds in a good nickel bath, then wash and immerse in the gun metal bath. When lacquering use a good body lacquer and tone to a slight green by dissolving green aniline in denatured alcohol and add a few drops to the lacquer to give a greenish tint. This method will give you good results.—C. P.

Q.—Kindly advise us as to the composition of a lacquer suitable for covering iron nipples to prevent rust. It must be very fluid so as not to produce too heavy a coating.

A.—There is a lacquer used by the United States Government for lacquering tin cans to prevent rusting which is known as Russian lacquer. It is prepared by dissolving gum copal in fusel oil in the proportion of 8 ounces of the gum to 1 gallon of the oil. Another lacquer that will answer your purpose consists of white copal French varnish cut with denatured alcohol. The thinner or reducer is composed of equal parts of fusel oil and amyl acetate. A fluid solution for dipping purposes should consist of the varnish 1 gallon and the mixed thinner 1½ gallons; this will dry without heat.—C. P.

Q.—(1) Please give me a 14 karat shade solution for doing stick pins in a basket. (2) In March you published an imitation silver deposit by Chas. H. Proctor in which it was mentioned to dissolve the soda until it showed 22 degrees Baume. What is meant by this?

A.—(1) To produce a 14 karat shade solution without using gold procure from the Hanson & Van Winkle Company, of Newark, N. J., red oreide. Dissolve this in nitric acid; precipitate with carbonate of soda, then wash thoroughly and dissolve in cyanide of potassium in the following proportions: ½ ounce of the oreide reduced to carbonate, 1½ ounces cyanide and ½ ounce bisulphite of soda to each gallon of water. Use the solution nearly boiling. An anode of the same composition should be used with a fairly strong current. Basket work can be done in this solution and good results may be obtained. The oreide also comes in the yellow color for regular 24 karat shade. (2) Dissolve bisulphite of soda in warm water until the density of the solution reaches 22 degrees, as indicated when the Baume hydrometer is immersed in the solution. The Baume is the regular scale for testing the density of liquids.—C. P.

Q.—I am finishing rose gold scarf pins with the following solution: Cyanide potassium, yellow prussiate potash, chloride of gold. This gives a nice yellow rose gold, but what I want is a red-tinted rose gold in the background and Roman gold finish on the high lights and back of the pin. Adding copper to the solution does not work.

A.—To produce a more reddish tone of rose gold add about a pennyweight of sal ammoniac to each gallon of the gilding solution. Use the solution nearly boiling with a good strong current to produce at first a deep rose; then reduce the current sufficiently to give a brighter tone. Relieve with saleratus on the high lights. If you do not obtain satisfactory results try a formula composed as follows:

Water	5 gals.
Sal soda	12 ozs.
Yellow prussiate of potash	10 to 12 ozs.
Neutral chloride of gold	1¼ ozs. Troy

The hydroxide of iron formed in the solution should be filtered out. Use the solution at the boiling point with a current of 6 volts.—C. P.

Q.—We are manufacturing a liquid metal polish which has benzine as a base. Now, as the law requires a special license for all inflammable polishes, can you tell us what we can put in to destroy the danger of benzine without harming its other qualities?

A.—Not knowing the composition of your polish it is impossible for us to state what would destroy the inflammable part without injuring its value as a polish. Tetrachloride of carbon could be used in the place of the benzine; this has all the cleaning properties of benzine without any of its dangers, as it will not burn. You might try commercial benzole; this could replace the benzine also.—C. P.

Q.—We have been trying the formula for verde antique given in THE METAL INDUSTRY of March, 1906, as below, and find that after the second coating it always peels off. We think the glycerine causes the trouble.

Dry chloride of zinc	5 lbs.
Sal ammoniac	2½ "
Sulphate of copper	10 ozs.
Hydrochloric acid	5 "
Commercial glycerine	2½ "
Water	5 gals.

A.—You may overcome the difficulty you experience by reducing the solution, probably one-third, and then adding more glycerine, so that the coating will remain moister for a longer period. The trouble is caused by too strong a solution and too rapid drying of the surface.—C. P.

METALLURGICAL DIGEST

A REVIEW OF METALLURGICAL MATTERS OF THE WORLD.
TRANSLATED AND EDITED BY IRVING LANGMUIR, MET. E., Ph.D.

CAUSES OF DEFECTS IN HOT ROLLED SHEET COPPER.

Dr. W. Stahl in *Die Metallurgie* (1908, page 289) gives some useful information as to the causes of various defects found in hot rolled sheet copper.

It has often been observed, he says, that copper plates when they are heated for some time to a temperature only slightly lower than the melting point, gradually take up oxygen which penetrates deeply into the plates and combines chemically with the copper. Such burnt copper has lost a large proportion of its strength and is very unsuitable for rolling, for it is apt to be brittle and small fissures appear on the surface of the rolled sheet.

When the absorption of oxygen has not proceeded far enough to cause such marked effects, its influence is still shown by the appearance of flame-colored areas upon polishing the surface of the rolled metals. This phenomenon apparently does not bear any relation to the purity of the original copper, but seems to depend solely on the temperature and duration of the annealing and on the presence of currents of air in the annealing furnace. Although this moderate burning decreases the strength and lowers the ductility and malleability of the metal, still the plates may be used for the production of sheet copper, but when the burning has proceeded further the metal is no longer capable of being rolled. This lack of malleability in otherwise pure copper or the occurrence of the colored flame-like markings is an infallible criterion for the detection of burning. Chemical analysis always shows in such cases that the percentage of oxygen in the metal has increased from the original 0.04—0.07% up to several tenths per cent.

Besides the above-mentioned markings on the surface of the polished metal there may occur greenish yellow spots or streaks. These are caused by impurities, such as oxides of nickel, antimony, lead and copper which were present in the original metal. Except in extreme cases these have little or no effect on the workableness of the copper. Chemical analysis shows that the composition of such copper is the same as that of the original.

Under certain conditions the plates of metal are too strongly heated before rolling, without, however, being actually burnt. The result is that the thin coating of cuprous oxid is pressed into the metal, producing, when this is polished, characteristic dark red spots and streaks. As far as the mechanical properties and the chemical composition are concerned, however, this "overheating" of the copper is found to be without effect.

Another defect to be observed in polished sheets is the occurrence of long streaks or elongated spots of a dull and rough appearance which are mechanically weaker than the rest of the metal. The cause of this, if we exclude the possibility of defects in the rolls, is to be found in defective casting of the plates from which the sheet copper is rolled, thus producing portions which are porous. Chemical analysis shows that the percentage of oxygen in such cases is normal, about 0.03 to 0.06%.

Small branching fissures in the surface of the metal, giving an appearance rather similar to that of seriously burnt copper, yet easily to be distinguished from this by the skilful worker, are caused by the presence of reducing gases, such as hydrogen or hydrocarbons, in the annealing furnace. Such gases reduce the cuprous oxid to metallic copper and set free steam which in forcing its way to the surface causes the defects above described.

It sometimes occurs that one side of the rolled sheet exhibits a number of well-edeveloped blisters close to the surface of the metal or in other cases the blisters may be nearly half way between the two surfaces. This defect is caused by rolling at too high a temperature.

When the plates as cast are unsound, containing cavities or having a honeycombed structure, the sheets rolled from them will have an appearance which cannot be mistaken for that of any other of the defects already described. The flaws in the castings cause scales on the sheet metal which may be partly separated from it, and when then exhibit a characteristic play of colors.

CONSTITUTION OF ALLOYS OF COPPER, NICKEL AND ZINC.

Metallurgie (June-August, 1908) contains the record of an exhaustive investigation into the constitution of alloys of copper, nickel and zinc by Dr. Victor E. Tafel. These alloys present an unusually complicated problem to the metallographist and such thorough work as Dr. Tafel has done calls forth the highest admiration. New data was secured on the three binary alloys, copper-zinc, copper-nickel and zinc-nickel, and then compared with the results of other investigators. The ternary alloys were found to offer still more difficult problems than any of the binary alloys.

Although the author devoted himself primarily to the study of the constitution of the alloys he has to some extent considered the properties of the alloys which might be of value to the industries. He concludes that, besides those already used in commerce, the alloys most worthy of mention are:

1. Alloys of 15 3-20% of nickel, 73-80% of copper and 7% of zinc have, when polished, a remarkably close resemblance to silver, not only in color, but in ductility as well.
2. Alloys of 33-40% of nickel, 7-20% of copper and 40-52% of zinc are unusually hard and tough. It is very doubtful, however, if these alloys can be successfully prepared on a large scale, because of the difficulties in getting a homogeneous mixture of the metals.

A solder for aluminum has been patented by G. Cazalas (French Patent 381,878), consisting of an alloy of 2 parts of tin, 1 part of zinc, to which is added 10 per cent, of magnesium chloride. Soldering is done at a low temperature, using as a flux a solution of naphthalene and camphor in alcohol.

The *Metallarbeiter*, a technical weekly paper published in Berlin, which has often been quoted in these columns, has changed its name to the *Metall-Technik*, and has also turned its activities more toward the field of non-ferrous metals. The *Metall-Technik* now occupies about the same position in Germany that the METAL INDUSTRY does in America.

Fritz Dannert, of Berlin, has patented a process by which he claims he can obtain alloys of copper and iron containing higher percentages of these metals than has been heretofore possible. The process consists essentially in adding 8-20 per cent. of aluminum to the molten mass of copper and iron 40-60 per cent. An alloy of finer grain and great crushing and tensil strength is said to be produced.

Richard B. Wheately, of Barnsbury, England, has patented (German Patent No. 187,416), a process of producing a homogeneous alloy of tungsten with copper, zinc and tin by the addition of tungsten in the form of phosphor tungsten, characterized by adding arsenic, as a deoxidizing agent, to the phosphor-tungsten.

A process of coloring copper has been patented by P. Hänisch, of Munich, Germany (German Patent No. 189,880). The copper is heated by a tapering flame, different parts being heated unequally, thus producing coatings of oxide of varying thickness, which, when treated with a coloring corrosive, consisting of water, copper sulphate, alum and verdigris, take on different colors.

Associations and Societies

REPORTS OF THE PROCEEDINGS OF THE METAL TRADES ORGANIZATIONS.

AMERICAN BRASS FOUNDERS' ASSOCIATION.—President Charles J. Caley, New Britain, Conn.; secretary, W. M. Corse, 54 Lathrop avenue, Detroit, Mich.; treasurer, John H. Sheeler, Philadelphia, Pa. The object of the association is purely educational, and is accomplished by the collection of such information as will be of benefit to the members and to general shop practice, by the presentation of papers on appropriate subjects, and by the publication of such literature.

Secretary Corse has recently issued a list of members, and though THE METAL INDUSTRY has published the names of the members from time to time, we herewith have the pleasure of again printing this list which not only contains the names of the members, but also their occupation and address. We do this to show how the Association is progressing, it already having a membership of 175 and a personnel which is not only excellent, but representative of the various branches of the metal industry. Careful perusal of the list is an incentive for everyone interested in metals to become a member of the Metal Association.

Secretary Corse in another circular sets forth the reasons for joining the association. The circular contains the list of officers which we herewith print, and following this the members.

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E

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FORD, ALLAN P., Eaton, Cole & Burnham Co., Bridgeporit, Conn.
FOUNDRY, THE, A. O. Backert, Editor, Cleveland, O.
FREYSINGER, JOHN B., Winchester Repeating Arms Co., 550 Dixwell Ave., New Haven, Conn.

G

GAMBLE, J. N., National Tube Co., Kewanee Works, Kewanee, Ill.
GAUTIER, J. H. & CO., David R. Daly, V. P., Jersey City, N. J.
GENERAL FIRE EXTINGUISHER CO., Russell Grinnell, V. P., Providence, R. I.
GORDON, J. R., Arlington, N. J.
GRAND RAPIDS BRASS CO., Daniel W. Tower, Pres., 156 Court St., Grand Rapids, Mich.
GREAT WESTERN SMELTING & REF. CO., 179 W. Kinzie St., Chicago, Ill.
GRIMSHAW, FREDK., North East, Pa.
GUTSCH, J. A., 682 E. 102nd St., Cleveland, O.

H

HAASIS, A. L., Jos. Dixin Crucible Co., Jersey City, N. J.
HAINES, JONES & CADBURY, INC., Jos. W. Sharp, Jr., V. P., 1136 Ridge Ave., Philadelphia, Pa.
HANNER, EDWARD, Mgr. Johnsonburg Machine Co., Johnsonburg, Pa.
HARTMAN, WM. T., Supt. Messrs. P. & F. Corbin, New Britain, Conn.
HAZARD COATES & BENNETT CO., F. W. Reidenbach, Secy., Rochester, N. Y.
HOFFMAN & BILLINGS MFG. CO., E. A. Neidecker, V. P., Milwaukee, Wis.
HOMER BRASS WORKS, Water and Miffley Sts., Philadelphia, Pa.
HOWE, JEREMIAH, Supt. Michigan Copper & Brass Co., Detroit, Mich.
HUNT, DAVID, JR., care of The Warner & Swasey Co., Cleveland, O.

I

IRON AGE, 14-16 Park Place, New York, N. Y.

J

JOHNSON SERVICE CO., W. L. Johnson, Milwaukee, Wis.

K

KASJENS, JACOB J., Brass Foundry & Heating Co., Peoria, Ill.
KEATING, WM., 237 Lansdowne Ave., Toronto, Can.
KELLEWAY, WM. S., Hub Foundry & Plating Co., Ossining, N. Y.
KINGSLEY, HENRY L., Mgr. N. Y. Office, Warner & Swasey Co., 149 Broadway, New York, N. Y.
KINSEY & MAHLER CO., corner Adams and Harrison Sts., Peoria, Ill.

L

LANDERS, FRAY & CLARK, C. F. Smith, Pres., New Britain, Conn.
LANE, HENRY M., 1924 Prospect Ave., Cleveland, O.
LAWRENCEVILLE BRONZE CO., Edward Kerr, 31st & Penn. Ave., Pittsburg, Pa.
LEBHERZ, JOHN, Mgr. Frontier Brass Foundry, Niagara Falls, N. Y.
LEVETT, WALKER M., 464 Tenth Ave., New York, N. Y.
Little, Arthur D., Chemical Engineer, 93 Broad St., Boston, Mass.
LOGAN, JOHN, National Cash Register Co., 1151 Wyoming St., Dayton, O.
LONERGAN, JOHN E., 211 Race St., Philadelphia, Pa.
LUMEN BEARING CO., Wm. H. Barr, Treas., 1155 Sycamore St., Buffalo, N. Y.
LYMBURNER, H. N., Lymburner, Ltd. Co., Commissioners and Berri Sts., Montreal, Canada.

M

MACK, J. W., Secy. and Treas., Nathan Mfg. Co., P. O. Box, 1688, New York, N. Y.
McCONNELL, D. A., Lovell McConnell Mfg. Co., 365 Market St., Newark, N. J.
McGARVEY, JOSEPH, Asst. Supt. Speakman Supply & Pipe Co., Wilmington, Del.
McPHEE, H., Robt. Mitchell Co., Ltd., Montreal, Can.
MEADOWCROFT, J. R., Mgr. The Garth Co., 26 Craig St. W., Montreal, Can.
MERRIAM, EDMUND A., Treas. Turner & Seymour Mfg. Co., Torrington, Conn.
METAL INDUSTRY, THE, Palmer H. Langdon, 61 Beekman St., New York, N. Y.
MITCHELL CO., THE ROBT., W. V. Shaw, Secy.-Treas., Montreal, Can.
MOLDENKE, RICHARD, Watchung, N. J.
MONARCH ENG. & MFG. CO., Baltimore, Md.
MORRISON BRASS MFG. CO., THE JAS., Chas. E. Morrison, Secy.-Treas., 81 St. George St., Toronto, Can.
MOUSSETTE, O. J., Driggs Ave. corner N. 10th St., Brooklyn, N. Y.
MUELLER, PHILIP, H. Mueller Mfg. Co., Decatur, Ill.
MUMFORD CO., THE E. H., 1223 Spring St., Philadelphia, Pa.
MURPHY, M. F., Gen. Supervisor Foundries Amer. Locomotive Co., Schenectady, N. Y.
MUHLFELD, J. E., Supt. of Motive Power B. & O. R. R., 2214 Eutaw Place, Baltimore, Md.

N

NATHAN, ALFRED, P. O. Box, 1688, New York, N. Y.
NEVILLE, W. E., 1322 Callowhill St., Philadelphia, Pa.
NORTH & JUDD MFG. CO., E. M. Wightman, Sec., New Britain, Conn.

O

OBERDORFER BRASS CO., Jonas L. Oberdorfer, P. O. Box 282, Syracuse, N. Y.
OHIO BRASS CO., L. W. Olson, Supt., Mansfield, Ohio.

P

PAGE, W. MARSHALL, Duplex Metals Co., Chester, Pa.
PARK, W. R., Supt. United Injector Co., 23 Watson St., Boston, Mass.
PATCH, NATH. K. B., Mgr. Lumen Bearing Co., Toronto Jct., Can.
PECK BROS. & CO., New Haven, Conn.
PEERLESS HEATER & VALVE CO., H. S. Prince, V. P., Flint, Mich.
PENBERTHY INJECTOR CO., Detroit, Mich.
PHIPPS, ROB., Frontier Brass Foundry, Niagara Falls, N. Y.
PITTSBURG BRASS MFG. CO., Thos. Ward, Pres., 3155 Penn Ave., Pittsburg, Pa.
PITTSBURG METER CO., A. G. Holmes, Mgr., P. O. Box 252, Pittsburg, Pa.
PORTER, W. A., Asst. Mgr. Somerville, Ltd., 59 E. Richmond St., Toronto, Can.
POWELL CO., THE WM., Cincinnati, Ohio.
PRIDMORE, HENRY E., 19th and Rockwell Sts., Chicago, Ill.
PROCTOR, CHAS. H., 621 Chestnut St., Arlington, N. J.

Q

QUIGLEY, W. S., Rockwell Furnace Co., 26 Cortlandt St., New York, N. Y.

R

REGESTER, E. C., J. Regester Sons Co., Baltimore, Md.
REILLY, MARTIN J., Franklin Brass Foundry, 100-102 Young St., Long Island City, N. Y.
RENNEBERG, CHAS., McNab & Harlin Mfg. Co., Paterson, N. J.
RICHARDSON, EDRO, 318 N. Holliday St., Baltimore, Md.
RICHARDSON, HORACE, Treas. Taunton Crucible Co., Taunton, Mass.
ROBERTS, EARL W., The Roberts Brass Mfg. Co., 328 Ferdinand Ave., Detroit, Mich.
ROSS-TACONY CRUCIBLE CO., Henry A. Ross, Tacony, Philadelphia, Pa.

RUSSELL & ERWIN MFG. CO., I. D. Russell, Treas., New Britain, Conn.

S

SCHILLING, JOSEPH, Supt. Russell & Erwin Mfg. Co., New Britain, Conn.
SCHNEIDER, EMIL, 298 South St., Newark, N. J.
SCHNELL, FRED., 501 Fourth St., Buffalo, N. Y.
SCHUTZ, J. H., H. Mueller Mfg. Co., Decatur, Ill.
SEYMOUR MFG. CO., O. F. G. Boeker, Seymour, Conn.
SHARP, J. CESSNA, Jno. C. Sharp Brass Works, Chattanooga, Tenn.
SHEELER, J. H., Sheeler, Hemsher Co., 811 Fairmount Ave., Philadelphia, Pa.
SHERMAN, H. B., Battle Creek, Mich.
SMITH, WM. A., Atlas Brass Foundry, 112 Greenpoint Ave., Brooklyn, N. Y.
SOMERVILLE, LTD., W. A. Porter, Asst. Mgr., 59 Richmond St. E., Toronto, Ont.
SPEAKMAN, WILLARD A., Speakman Supply & Pipe Co., Wilmington, Del.
SQUIRES, J. D., Mgr. The Lyman Mfg. Co., Buffalo, N. Y.
STANDARD SANITARY MFG. CO., Ahrens & Ott Works, Louisville, Ky.
STERLING SMELTING CO., 48 Greenpoint Ave., Brooklyn, N. Y.
SUPERIOR BRASS FOUNDRY, John A. Macaulay, Laurium, Mich.

T

TALLMAN, A. H., J. N. Tallman & Sons, 72 Wellington St. N., Hamilton, Can.
TAMPA FOUNDRY & MACHINE CO., J. K. Merrin, Sec., Tampa, Fla.
TAYLOR, URIAH, Robt. Taylor & Son, Paterson, N. J.
THOMPSON, HUGH L., 86 Paterson Ave., Waterbury, Conn.
TOOTHE, EDWARD S., Nathan Mfg. Co., 85 Liberty St., New York, N. Y.
TRENTON BRASS & MACHINE CO., W. H. Schulte, Mgr., Trenton, N. J.

U

UNION BRASS & METAL MFG. CO., E. J. Seitz, Sec., St. Paul, Minn.

V

VULCAN LOUISVILLE SMELTING CO., Julius R. Kahn, First National Bank Bldg., Chicago, Ill.

W

WAKEFIELD, F. W., Vermilion, O.
WALTERS, GEO. W., Dent Hardware Co., Fullerton, Pa.
WALWORTH MFG. CO., A. M. Mattice, Works Mgr., First and O Sts., So. Boston, Mass.
WARNER, A. H., E. Stebbins Mfg. Co., Springfield, Mass.
WEBSTER, WM. R., Genl. Supt. Bridgeport Brass Co., Bridgeport, Conn.
WETHERILL, S. P., JR., Erie Ave., E. of Richmond St., Philadelphia, Pa.
WHITING FOUNDRY EQUIPMENT CO., Harvey, Ill.
WIESING, GEO. F., Supt. Brass Dept., Sayre Stamping Co., Sayre, Pa.
WILSON, WM. L., U. S. Aluminum Co., Pittsburg, Pa.
WOLFF MFG. CO., L., Harold Wolff, 93 W. Lake St., Chicago, Ill.
WOLVERINE BRASS WORKS, L. A. Cornelius, Pres., Grand Rapids, Mich.
WOODBRIDGE, MURRAY, Mgr. Gen. Brass Works, Ltd., 69 Sterling Road, Toronto, Can.
WRIGHT, GLANVILLE W.

Y

YALE & TOWNE, MFG. CO., W. C. Allen, Gen. Supt., Stamford, Conn.

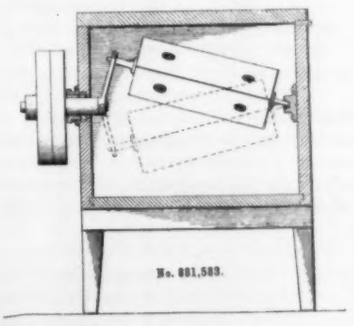
Z

ZELLER, FRANK, Kelly & Jones Co., 616 Brandon St., Greenburg, Pa.

PATENTS

REVIEW OF CURRENT PATENTS OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

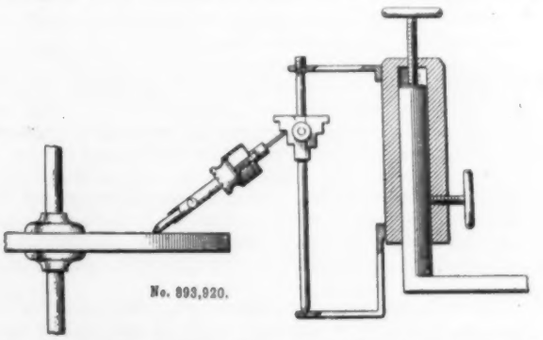
881,583. March 10, 1908. JEWELRY POLISHING DEVICE. Curtis H. Hodgins, Attleboro, Mass. This relates to polishing devices adapted for use in polishing and burnishing jewelry and similar



small objects while they are immersed in a suitable cleansing solution. The receptacle is rotated in the bath, thereby subjecting the articles to a tumbling and rolling action, which exposes every part of the surface to the polishing medium.

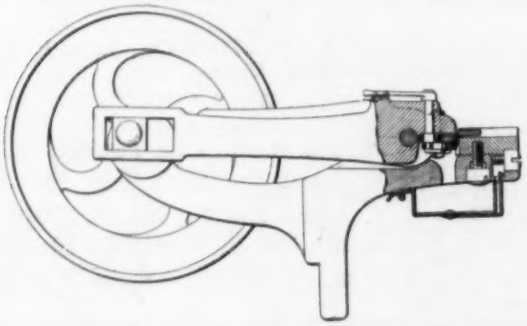
896,379. August 18, 1908. SNAP BAND FOR MOLDS. William Hales, of St. Louis, Mo., assignor to the Charter Oak Stove & Range Company, of same place. The object of this invention is to construct a band which is designed to fit over a sand mold, after the snap flask in which the mold has been formed has been removed, preparatory to pouring the molten metal into the mold. The band completely covers the joining edges of the mold and prevents the leakage of metal which might by chance pass through the center joint located between both halves of the mold.

893,920. July 21, 1908. GEM CUTTING AND POLISHING APPARATUS. William H. Griesch, of Brooklyn, N. Y. This device is particularly intended for the cutting and polishing of precious stones. It is so designed as to insure accuracy with respect to all the facets in any one row around the gem with regard both to the angle thereof with the axis of the gem and to the breadth



of the facets. Further, as diamond cutting is a comparatively slow operation, it is essential that the machine used by the lapidary shall be capable of rapid manipulation in order to limit the expenditure of time as much as possible, without detracting from the other features mentioned.

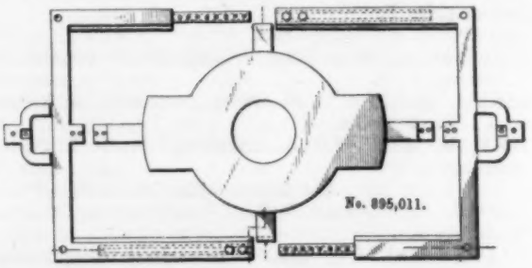
896,924. August 25, 1908. Machine for Cutting Jewelers' Solder. George Lieb, of Newark, N. J. This machine is intended for cutting jewelers' solder into small pieces for use. The machine takes a strip of the solder and cuts it off in a notched



configuration to form, on each succeeding cut, a small piece of solder, and in this way the toothed projections and the part bordering on the recesses between the toothed projections are gradually cut away and deposited and then used by the jeweler in completing different articles.

894,880. August 4, 1908. Rod Packing. Olin J. Garlock, of New York City. Assignor to the Garlock Packing Company, of same place. This packing is intended for hydraulic work, the metal member being intended for taking the wear, and the packing being such as is best adapted for the duty. The stuffing box at the end of the cylinder is made shallow so as not to project too far from the end of the cylinder. The packing is such that a few rings are sufficient to perfectly pack the rod and keep the joint around it tight and prevent the escape of the water. This improvement is applicable to rings, whether the wear comes on the outer or the inner periphery. The metal ring is V-shape and its inclined sides are embedded in the body portion of the packing ring.

895,011. August 4, 1908. Molding Machine. Frederick W. Hall, assignor to the J. W. Paxson Company, of Philadelphia, Pa. One of the objects of this machine is to provide a flask frame for the pattern, of such character that the strain on the molded patterns or castings, caused by the sand under pressure, will be largely taken up; a strain which, in flask and vibrator frames as now made and used, frequently results in breaking the molded



metal patterns. The frame is adjustable in area to adapt it to hold a greater variety of sizes of patterns than is now possible. The pattern supporting frame is made in sections, with means to guide the sections to and from each other and to lock them in any position relatively to each other. The flask fitting of the drag and the handle of the pattern frame are constructed in such a manner as to provide a lateral recess or space between the flask fitting of the drag and the handle of the pattern frame. With this construction many different sizes of patterns can be used in the same frame, resulting in great economy.

TRADE NEWS

TRADE NEWS OF INTEREST DESIRED FROM ALL OF OUR READERS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

Nathan Nelkin, formerly at 79 Canal street, New York, has moved his plating and polishing plant to 131 Canal street.

The Acme Manufacturing Company, formerly located at 47 South Canal street, Chicago, Ill., have moved to 74 Monroe street.

Collins & Wright, pewter and table hardware manufacturers, formerly located at 425 1st avenue, Pittsburg, Pa., have moved to 55th and Butler streets.

The Aluminum Foundry Company of Manitowoc, Wis., has filed an amendment increasing the capital stock from $50,000 to $100,000. The president of the company is Conrad Werra and the secretary Jennie Dempsey.

The N. B. Cook Oil Company, 148 Front street, New York, is furnishing electroplaters and polishers with a high grade whale oil soap for cleaning grease from brass goods, etc. This soap is said to have proved very satisfactory to its users.

The Fisher Manufacturing Company, manufacturers of novelties and specialties in wire brass and other metals, at present located at 48 Redwood avenue, Paterson, N. J., contemplate moving their works to Newark, N. J., about the first of next month.

An automatic fire protection system of 2,000 sprinkling heads fed from a 40,000 gallon wooden and metal tank raised 100 feet over the buildings, is being installed at the Lloyd-Booth department of the United Engineering & Foundry Company, Youngstown, O.

There never seems to be a dearth of inventors of aluminum solder. The latest brought to our attention is a solder produced by Dr. O. F. Reinhold, 53 Demarest street, Newark, N. J. Dr. Reinhold announces that his solder is satisfactory and that it has been thoroughly tested.

The Magnus Metal Company, of Chicago, Ill., has started a foundry at Ata, Atlanta, Ga., for the manufacture of journal bearings and engine brass castings. The foundry is 80 by 200 feet and is equipped with modern machinery. The district manager at Atlanta is T. F. Kent.

August Schmitz, Dusseldorf 64, Germany, a manufacturer of rolling-mill machinery, is planning to build a larger shop. At present he employs 120 men but needs more room. Mr. Schmitz sells rolls to the industrial countries of the world and is a large user of American machinery for building his rolls.

A Reading, Pa., paper states that the William S. Cooper Brass Works, at 8th & Chestnut streets, is running full time with a force of 50 men. The firm manufactures plumbing supplies of all kinds and has a large number of orders on hand. J. W. Van Meter, the business manager, stated that it now seemed very likely that the firm would run full time all winter.

Hardwood sawdust, including boxwood, maple, and other kinds, for use in drying out plated or dipped goods, is furnished in large or small bags by John Sommer's Son, 355 Central avenue, Newark, N. J. This firm supplies a large proportion of all the sawdust used for this purpose; if there be any who have not tried it a free sample will be sent on application to the firm at the above address.

John Hassall, Inc., 183 Lafayette street, New York, manufac-

turer of brass, copper, iron and German silver rivets and nails, reports that business has improved very noticeably during the past few months. The works in Brooklyn are now running full time and with a full force of employees. The month of August showed double the amount of business done as compared with May and June.

W. L. Abate, 26 West Lincoln avenue, Mt. Vernon, N. Y., reports a large number of inquiries for his patent Manufacturing Chuck, and a goodly number of sales. He is prepared to furnish this chuck for operation in the ordinary way, or by compressed air. When operated by air this chuck greatly increases the output of a lathe, particularly for such goods as valve bodies, packing nuts and similar pieces.

The Kettler Brass Manufacturing Company, of Houston, Texas, was established three years ago by M. F. Kettler. The plant now covers 50 x 100 feet and is two stories high. A large line of brass goods is manufactured, some of which are working barrels, cylinders, float valves, oil well supplies, brass raised letter signs, bank fixtures, etc. The plant has a melting capacity of 2,200 pounds per day. The company is capitalized at $30,000.

In this issue of the METAL INDUSTRY, Zucker & Levett & Loeb Company, of New York, begin advertising their new Triplex Buff. This buff has been thoroughly tried out under all sorts of conditions during the past year, and the Zucker & Levett & Loeb Company offer recommendations from a large number of prominent concerns in support of their claims that the new principle upon which it is constructed makes this buff much more efficient than any heretofore in use.

F. H. Lovell & Company, Arlington, N. J., who make a specialty of brass and white metal castings to meet Government specifications and requirements, announce that an account of an unusually light demand for their regular products they are prepared to offer special inducements to users of white metal castings who are now in the market. The large Arlington plant of this company is well equipped for the manufacture of high-grade castings in large or small quantities.

The North American Smelting Company is one of Philadelphia's long-established metal concerns, having been established in 1865. The company has large works at 9th and Thompson streets, and manufactures and sells a variety of metals, including phosphor bronze and brass ingots and castings, ingot coppers, Climax bronze, manganese bronze, anti-acid bronze, babbitt, type, linotype and stereotype metal, tinners' and braziers' solders, wire and triangular solders, bar tin, lead and block tin pipe.

The W. S. Rockwell Company, 50 Church street, New York City, has been organized to carry on furnace engineering and the manufacture of fuel oil appliances. The attention of the company will be directed toward furnace construction of every kind and it will be the aim to maintain the high standard which has made the name of "Rockwell" so prominent in furnace engineering for so many years. The company will also design and erect fuel oil appliances of the latest pattern and adapted for every duty.

Since the Eureka Pneumatic Sprayer was introduced to the metal trades a few years ago it has in some lines revolutionized the old methods of applying lacquer, bronze, enamel, varnish, etc., and at present it is to be found in most of the important metal finishing establishments throughout the country. This sprayer is operated by compressed air and it is furnished and complete lacquering outfits are installed by the manufacturers, the Eureka Pneumatic Sprayer Co., 400 Canal street, New York.

Batcheller, Clark & Batcheller, 90 West street, New York, build one of the most substantial sand blast machines on the market. This machine, known as the Danic Sand Blast is made in 12 sizes, holding from 400 to 2,200 pounds of sand. It has been installed in a large number of important foundries and is reported by the makers to be giving excellent results in all lines of work. These machines will be shipped on trial to any responsible firm which contemplates installing one or more machines.

The Metallic Alloys Company, 30 Church street, New York, have for some time been supplying a number of large brass foundries with manganese dioxide, a flux and cleanser which has been found to possess many excellent qualities, especially for use in fluxing scrap that contains sand and iron filings, and in the recovery of metal from dross. Inasmuch as this flux does not form hydrofluoric acid, as do most fluxes when heated, it will not in any way injure the crucible. Manganese Dioxide posseses strong deoxidizing qualities which tend to make a solid, dense casting of great transverse and tensile strength.

George W. Simpson, proprietor of the San Diego Iron Works, San Diego, Cal., has purchased from Goodman Brothers the plant complete, and also the ground on which it stands, of the Eureka Brass Foundry, and will continue the business in connection with his own. Mr. Simpson started in business with a small repair shop five years ago and now has a boiler shop which compares favorably with any in Southern California, having a capacity for three-quarter-inch plate. In the Eureka Foundry for the present he will have three pourings weekly of iron, brass, bronze or aluminum. The future for the industry appears most bright.

A bearing metal that has had an extensive sale in both Europe and America is Shonberg's M. M. Grade Bearing Metal, made by I. Shonberg, 363 Hudson avenue, Brooklyn, N. Y. It was introduced into the United States nearly thirty years ago, and has been used for freight and passenger cars, locomotives, street cars, steamships, and for similar purposes, by the Southern Pacific Railroad, Pacific Mail Steamship Company, on the San Francisco street railways, and by many other corporations and individuals. It has also been found excellent in automobile and motor boat construction. Mr. Shonberg also makes all kinds of type metals and buys and smelts drosses and ashes.

A device for testing gas cocks for leaks has been put into use at the plant of the American Pin Company, Waterbury, Conn., which is one of the largest manufacturers of gas cocks in the world. With this device, which is small and takes up but little space, it is said that one man can test 10,000 cocks a day, as compared with an output of 700 or 800 a day by the old methods. This tester is made by Leiman Brothers, 62 John street, New York, who state that it has also been adopted by the Union Gas & Electric Fixture Company, J. M. Erhlich, President, New York; the Enos Company, New York; Gibbon Gas & Electric Company, Philadelphia, and numerous other concerns.

The J. W. Paxson Company, of Philadelphia, Pa., want all of the foundrymen to call on them the week of October 5-10th, when Philadelphia is to celebrate the 225th anniversary of the founding of that city. The J. W. Paxson Company state that there is much of interest to foundrymen in Philadelphia, the greatest manufacturing city in America, and it is also stated that there are more foundries (including the iron, steel, brass, bronze, aluminum, silver and gold) also smelting and refining works and rolling mills in Philadelphia than any other city in the world. The naval parade, which is to be a part of the city's celebration, can be seen from the J. W. Paxson Company's pier 45, Delaware River.

The Steele & Johnson Manufacturing Company, of Waterbury, Conn., manufacturers of button and brass goods, have found it necessary to make extensive changes in their plant, and plans have been prepared to replace the present structure with a building modern in every respect. The new building will be 40 by 150 feet, with basement; it is expected to be ready before winter sets in. This company was organized in 1852 with a capital of $6,000 to manufacture gilt and plated metal buttons. The business was continued until 1856, when it was sold to the Waterbury Jewelry Company, which went into liquidation in the following year. In 1858 the present company was organized, the officers now being Charles Mitchell, president, and Benjamin L. Coe, secretary and treasurer.

On Tuesday, September first, the Jonathan Bartley Crucible Company, of Trenton, N. J., made their first crucible. The incorporation of this company with $125,000 capital and its officers has already been noted in THE METAL INDUSTRY. The leading spirit in the enterprise is Jonathan Bartley, who for many years was

superintendent at the plant of the Joseph Dixon Crucible Company, of Jersey City, N. J. Mr. Bartley states that he has the latest and best of crucible-making machinery and that his factory is located in the heart of Trenton and has railroad and water connections. The plant is of steel and brick with a working space of 60,000 square feet. It is the intention of the company to open offices in the leading cities of the world and be ready to market the product by December first.

The United States Sherardizing Company, New Castle, Pa., who have acquired the rights in the United States for the patented process of dry galvanizing, report that they are making progress. The Government is specifying for sherardized material. The product has also been approved by the Underwriters' Testing Laboratories. The United States Company have plants established in New York, Cleveland, Economy, Pa., New Castle, Pa., Elkhart, Ind., Detroit, Mich., and report that they are about ready to close a contract with several large concerns in the East to use this process. The company have just issued a circular entitled "What Is Sherardizing." The process was first described in THE METAL INDUSTRY August, 1904, and its progress has been mentioned from time to time since then in these columns.

Dundee, N. Y., is to have a new industry in the Dundee brass manufacturing, which has been capitalized at $50,000. A building 40 by 200 feet will be located near the electric lighting plant, as the company will get light and power from this plant. The business men of the village have subscribed to $20,000 of the stock and these stockholders have formed a temporary organization by electing the following directors and officers: Directors, Henry Ferando, T. D. Beekman, Charles Goble, E. L. Bailey, Cyrus C. Harvey; chairman, Cyrus C. Harvey; secretary, Pierre L. Harpending; treasurer, Howard L. Woodruff. The company will make standard brass fittings, electric and gas fixtures and plumbing specialties, all the goods to be known under the title of "Bonnie Dundee" fittings. It is expected to have the plant ready for operation by the first of the year.

The services of Frederick B. Flinn, consulting chemist and metallurgist, 10 N. Maple street, East Orange, N. J., are now available to smelters, refiners, jewelers, electroplaters and others who require any analytical work or assaying done by an expert. Mr. Flinn's experience includes several years with the Balbach Smelting & Refining Company, Newark, N. J., and the Companie Metallurgica, Mexicana, besides a large amount of consulting work for prominent concerns, such as Handy & Harman, New York; Attleboro Refining Company, Attleboro, Mass., and George Baker, of Providence, R. I. There are undoubtedly hundreds of concerns in this country whose net profits might be substantially increased by substituting scientific methods for guesswork, particularly in ascertaining the quality of materials before purchasing and in improving alloys, processes and methods.

The manufacture of bronze powder and metal leaf is an industry the magnitude of which is but little appreciated by the users of these materials. An attempt has been made in the catalogue issued by W. H. Kemp & Company, 165 Spring street, New York, to illustrate and describe the various stages through which the metal passes in its transition from the original form of ingots to the finished powder, leaf or foil of less than one-one-thousandth of an inch in thickness. The process is interesting and the description well worth reading. A large part of the catalog is devoted to lists of the hundreds of articles made or handled by this firm for the use of metal finishers, gilders, bronzers, decorators, etc., which lists include plater's silver, brass, oreide and german silver, aluminum solder and rivets. Aluminum in the form of ingots, sheets, rods, wire and tubing is also furnished.

Antimony metal of a guaranteed purity of not less than 99% is one of the special lines handled by C. W. Leavitt & Company, Importers, 222 Broadway, New York. This firm is exclusive agent for the "A. S. P." brand English Star antimony, manufactured by the St. Helens Smelting Company, St. Helens, Lancashire, England. Those interested in the manufacture of bearing and type metals, britannia metal, pewter and other metals containing antimony, can obtain full information regarding this material from the above-mentioned firm. Excellent results in making aluminum-antimony alloys are being secured, these alloys being hard, tenacious, elastic and malleable. They are said to be capable of taking a high polish and will resist atmospheric corrosion. C. W. Leavitt & Co. are headquarters for all kinds of imported metals and alloys, including magnesium, manganese, nickel, copper- and ferro-alloys, spelter, tin, zinc dust and other commercial and rare metals.

An aluminum dip lacquer that is said to be supplanting the old process of tinning castings used on washing machines, food choppers, mixers, ice cream freezers, wringers, lawn mowers, garden tools, wire wheels and other parts for children's vehicles, and on various other castings that were formerly tinned for finish and protection, is being manufactured by the Egyptian Lacquer Manufacturing Company, 152 Front street, New York. This well-known firm states that the same work that costs two cents per pound to hot tin can be done with their lacquer for less than half a cent per pound. The Egyptian Aluminum Dip Lacquer, it is said, will hold up the aluminum powder without stirring each time a dipping is done. It dries in about twenty minutes, flows the powder out to a heavy and perfect covering, retains the fine whiteness of the aluminum, makes a very hard finish and will not come off when handled. It can be done with the same speed, and is as simple in practice as ordinary dip lacquering.

H. Edmonds, Soho Hill Works, Birmingham, England, patentee and manufacturer of the Patent "Rapid" Shaking Machines described in THE METAL INDUSTRY, sends us a list of a few of the Birmingham jewelers who have adopted with success Mr. Edmond's machine, which is designed and built for polishing and burnishing without hand labor. Herewith is the list: Adie & Lovekin, Frederick street; Albert & Co., Spencer street; Buckley Bros., Regent place; Bragg & Co., Northampton street; Collins & Co., C. H., Hockley Hill; Crompton, R., Northampton street; Deakin, A., Vittoria street; Elkington & Co., Ltd., Newhall street; Empson, F. F., Ltd., Regent place; Green & Cadbury, Ltd., Gt. Hampton street; Griffith, Sydney, Soho Hill; Griffith, Henry, & Son, Warstone lane; Hopwood, T., Branston street; Haseler & Holmes, Vittoria street; Jennens Bros., Northwood street; Johnstone, G. H. & Co., Northampton street; Mantle & Sons, Warstone lane; Patterson, W. E., & Co., Warstone lane; Phillips, Hy., Gt. Hampton street; Pearce, H. H., Spencer street; Payton, Pepper & Sons, Ltd., Vyse street; Rabone, W. H. & F., Frederick street; Reynolds & Westwood, Vyse street; Round, B. J., & Sons, Northampton street; Richards, J., New Spring street; Reading, N. C. & Co., Hall street; Simmons, Bernard, R., Vyse street; Smith, A. J., Frederick street; Wareing, B., Northwood street; Wall, John, Ltd., Hockley Hill; Wilmot, W. H., Ltd., Albion street; Wall, Thos., Vittoria street; etc., etc., etc.

FINANCIAL

The directors of the Calumet & Hecla Mining Company have continued the reduced dividend rate established early in the year by the declaration of a quarterly dividend of $5 per share, which is payable September 29 to stockholders of record September 3. In the last quarter of 1907 a $10 dividend was paid and in the third quarter $15. With the payment of the dividend just declared the stockholders will have received $107,350,000 in dividends which have been paid without break since 1871. The capital consists of 100,000 shares of the par value of $25.

The Aluminum Company of America, formerly the Pittsburg Reduction Company, has filed with the secretary of state a statements of its financial condition December 31, as follows:

ASSETS.

Real estate	$758,493
Mach. construction and equipment	7,015,182
Merchandise	572,673
Manufacturers stock in process	548,118
Cash and debts receivable	2,574,102
Patent rights	177,000
Good will, investments	1,545,000
Total	$13,190,568

LIABILITIES.

Capital stock	$3,800,000
Accounts, bills payable	2,892,749
Profit and loss	6,497,819
Total	$13,190,568

INCORPORATIONS

In addressing newly formed corporations it is advisable to include the names of the incorporators.

THE MAMMOTH MANUFACTURING COMPANY, of Chicago, Ill., has been incorporated with a capital of $5,000 to manufacture metal specialties. The incorporators are: A. Watters, W. J. Helm and J. McDowell.

THE WILCOX & HARVEY MANUFACTURING COMPANY, of Chicago, Ill., has been incorporated with a capital of $10,000 to deal in all metal goods. The incorporators are: J. H. Harvey, H. B. Wilcox and J. M. Voorhees.

THE ACME NIPPLE MANUFACTURING COMPANY, of Chicago, Ill., has been incorporated with a capital of $5,000 to deal in plumbing supplies. The incorporators are: J. R. Griffiths, J. P. Glomb and W. S. Reid.

ROBERT TAYLOR & SON BRASS FOUNDERS, of Oakland, Cal., has been incorporated with a capital of $10,000 by Uriah Taylor, George A. Myers and Jacob Vanderclock. The company will make all kinds of brass castings.

A. C. LAYMAN MACHINE COMPANY, of Dover, Del., has been incorporated with a capital of $10,000 to engage in business as tool makers, brass founders, metal workers and fitters. The incorporators are: Alfred C. Layman, Frederick W. Balster, George L. Townsend, Jr.

THE NIAGARA LEAD COMPANY, of Niagara Falls, N. Y., has been incorporated with a capital of $100,000 by Edward G. Morris and Pedro Salome of Philadelphia, Pa., and F. L. Lovelace, 120 Main street, Niagara Falls. The company was formed to take over the works of the Lead Reduction Company, and will remodel the building and add a large amount of new machinery.

THE STANDARD SMELTING AND REFINING COMPANY, 7003 Quincy avenue, S. E., Cleveland, Ohio, have just incorporated for the purpose of smelting and refining brass and copper turnings, grindings, skimmings and all foundry residues. The manager and treasurer of this company held the same capacity formerly with the Lake Erie Smelting and Refining Company, of Cleveland, which company he organized some years ago. He has sold out his interest to enter into the new company which are building an up-to-date smelting plant of large capacity.

O. J. MOUSSETTE.—O. J. Moussette, the well-known manufacturer of the "Monarch" crushers and pulverizer, also tools, dies, presses and special machinery, has incorporated his business with the title of O. J. Moussette Company, Inc., 481 Driggs Avenue, Brooklyn, N. Y. Capital $20,000, charter issued by the State of New York. The directors are O. J. Moussette and Charles J. Moussette, of Brooklyn, and William Melvin, of Perth Amboy. The officers are: O. J. Moussette, president; Charles J. Moussette, vice-president; William Melvin, secretary-treasurer.

PRINTED MATTER

SOLDERING COPPERS. We have received a circular from the Buckeye Aluminum Company, of Doylestown, O., mentioning their "Magic" self-tinning soldering coppers, which they state require no tinning as they contain a solder-adhering element and will tin themselves while in use.

STEAM ENGINE INDICATORS. The American Steam Gauge & Valve Manufacturing Company, of Boston, Mass., have prepared a large catalogue descriptive of their Thompson improved indicator. In this instrument the motion of the pencil is absolutely parallel, this motion being secured by a link attached to and governing the lever direct. The pivots of this link are made free from any appreciable lost motion and will remain so indefinitely.

STAGGERED POINT STEEL BELT LACING, is described in a pamphlet from the Bristol Company, of Waterbury, Conn. In this lacing the staggered points enter the belt in double rows, insuring the greatest strength in the joint without injury to the material of which the belt is made. These lacings are manufactured in 10 different sizes and of different lengths, suitable for every width and thickness of belting from the lightest to the heaviest conveyor belts.

ASBESTOS PROTECTED METAL, as described in a catalogue by the Asbestos Protected Metal Company, of Canton, Mass., is particularly intended for roofing, siding and ceiling, as it is fireproof, waterproof and fumeproof. The material consists of sheet steel, pure asphalt and asbestos combined in such a manner that each gives protection to the others, with the result that the serviceable life of the finished product is far in excess of that of any one of the parts.

GRAPHITE. The September issue of this bright paper issued monthly by the Joseph Dixon Crucible Company, of Jersey City, N. J., is full of good things. Chapter V. is presented of the valuable series of articles by W. H. Wakeman on Preventing Corrosion of Steam Machinery. The contribution on Prolonging the Life of Crucibles by Dudley A. Johnson should prove of particular interest to our readers. There are also interesting items about Graphite Paint, Lead Pencils, Crayons, etc.

ELECTRIC MOTORS. Bulletin 159 by the B. F. Sturtevant Company, of Hyde Park, Mass., deals with their Type H motors which are specially designed for direct connection with the company's blowers and exhausters. These motors have operating characteristics which insure their fulfilling the exacting requirements of modern service with a minimum of repairs and attention. They are made open, semi-enclosed, or enclosed, according to the conditions of installation. They are made in horsepowers from 1 to 100.

THE "YANKEE" PRESSES. The Manville Brothers Company, of Waterbury, Conn., have sent us circulars of their presses. This press is driven by belt and was designed to take the place of the ordinary foot and screw press. It has an eccentric adjustment in the connection to govern the position of the slide, and is provided with a combination stop-clutch so arranged as to render a second revolution impossible without raising the foot. This makes feeding by hand practically safe. By throwing out the trip a continuous motion is obtained as long as the treadle is held down.

RECORDING THERMOMETERS. Two interesting pamphlets have been received from the Bristol Company, of Waterbury, Conn., dealing with their recording thermometers of which Class I is intended for atmospheric temperature and ranges up to 250 degrees Fahr. and the other, Class III, for working ranges from 40 to 800 degrees Fahr. The first makes a continuous record on a chart revolved in one week or one day, the record being made either on an 8- or a 12-inch chart. The second, making the same record, is particularly intended for kilns, core and enamelling ovens, drying apparatus, etc. In both cases the recording part of the apparatus may be placed at a distance from the bulb.

LINE AND LIGHTING MATERIAL FOR ELECTRIC RAILROADS is the title of a large catalogue prepared by F. H. Lovell & Company, of Arlington, N. J. As stated in the introduction the catalogue is intended for practical men who know what they want; it is not, therefore, filled with advice regarding certain patterns which are better than others, etc., etc. The company recognizes the fact that the user and not the manufacturer is far and away the best judge of local conditions which must govern him in his purchases. While standard devices are illustrated, the company is always willing to modify to suit the customer's needs. Attention is called to the fact that the company gained its training in work done for the United States Government, and all their brass and composition castings are of the best possible description.

FANNING MILLS AND TUMBLING BARRELS. From the Baird

Machine Company, of Oakville, Conn., we have received two handsome catalogues describing their fanning mills and oblique tilting tumbling barrels. The mill is intended for separating sawdust from small metal parts, such as pins, nails, tacks, fasteners, hooks and eyes, etc. It is also being used to advantage for separating chips from screws or similar work. The machine is extremely simple in construction and efficient in operation. One very important feature of the tumbling barrel mentioned is that the contents of the tumblers are visible at all times while the work is in progress, thereby allowing an examination at any time without delaying the work. The machine is fitted with ring oilers, adjusting screw, and the arrangement of a bushing on the main shaft which may be removed when worn and out of alignment, and replaced by a perfect one. The tumblers will operate in any desired position, and are raised or lowered by means of a crank.

MELTING FURNACES.—The Rockwell Furnace Company, of 26 Cortlandt street, New York City, have prepared a large and very handsomely gotten up catalogue of their furnaces for melting all metals, tinning, galvanizing, tool hardening and all other operations requiring molten metal. Their pit type crucible furnaces can be made to suit local conditions and special requirements. The furnaces for melting aluminum, brass, copper, iron, steel, etc., are so constructed as to permit the use of either coal, coke, oil, or gas fuel. Their small crucible furnaces are for melting and assaying, where small quick melts are desired for making special alloys, melting precious metals, analytical work, light castings, etc. In their tilting furnace the crucible is not removed from the furnace chamber, the metal being transferred to a heated crucible or ladle, as preferred, and then to the molds. The burner is located at the top of the combustion chamber and the flame is directed against the bottom of same, not against the crucible, thereby insuring maximum life to the crucible. Their double melting furnace is made up of two furnaces and the heat from the furnace actually engaged in the melting passes through the other, which is thereby heated ready to be put into operation as soon as the melt in the first has been accomplished. Many other types are also illustrated.

DAILY METAL PRICES

We have made arrangements with the New York Metal Exchange by which we can furnish our readers with the Official Daily Metal Market Report of the Exchange and a year's subscription to THE METAL INDUSTRY for the sum of $10. The price of the Report alone is $10. We can also furnish daily mill and factory reports covering all the news of mills, factories and machine shops to be built. Send for particulars.

METAL MARKET REVIEW

New York, September 14, 1908.

COPPER.—The price of standard copper in London shows a net advance for the month of about £1 per ton, the closing price being about 15s. below the highest point reached. Spot copper opened at £60 5s. and closed at £61 2s. 6d.

The New York copper market has held steady all the month and closes below the highest. It has been pointed out that the advance in copper during the past two months was entirely a matter of manipulation, mail advices from the other side confirm this assertion and show that the advance in G. M. B.'s in the London market was started by Americans buying futures and beginning the movement at a little below £56 during July and the price was run up to around £61, and about 3,000 tons were taken. With the advance of G. M. B.'s in London it was an easy matter to lift the American copper market, and of course the price of Amalgamated, the real aim of the whole movement, was boosted accordingly. The actual price of copper is a small matter really to the leading selling agents—they sell on a 2% commission and whether the price is 12 cents or 16 cents is a small matter to them compared to the deals to be made in the stock market, and the copper market is manipulated by these selling agents for the sole purpose of stock gambling—so much for the Wall street end of the copper market. American consumers came into the market fairly well and a good buying movement followed the advance, at the present the market is dull again and it is more than likely that a little reaction is due.

The exports for the month are heavy again, being 25,906 tons, making the total exports for the eight months of 1908 207,617 tons, against 110,746 tons for the same period of 1907. The market is more or less nominal with sellers of second hand lots making the price. Lake carload lots around 13¾ cents, electrolytic 13⅝ cents, and casting 13½.

TIN.—The London tin market shows a net decline for the month of about £6 per ton, there are no special features to note, the market in that center is entirely speculative and at times it is a matter of a toss up whether certain operators shall buy or sell. The market opened at £138, touched £131, the lowest point and closed at £132.

The New York market shows a net decline for the month of nearly 2 cents per pound and closes at the lowest price of the month. The consumption was 2,600 tons, making the total for the eight months of 1908 4,700 tons less than during the same period last year. The shipments from the Straits were fairly heavy, 6,055 tons, making an increase for eight months of 3,357 tons in the shipments over the same period last year. The total visible supply of tin at the end of August amounts to 17,257 tons, nearly 2,000 tons increase over a month ago. The market closes to-day dull and easier at around 29 cents for 5 and 10 ton lots—smaller lots 15 to 20 points higher.

LEAD.—The foreign lead market has ruled around £13 to £13 15s. during the month and closes at £13 5s.

The New York market has ruled firm all the month and the price to-day 4.60 to 4.65 New York is the highest point of the year. In St. Louis market prices have ranged from 4.40 to 4.50 East St. Louis carload lots, closing at 4.45 sellers with the New York market 4.60 New York.

SPELTER.—The foreign spelter market shows a net advance for the month of about 5s. per ton.

The New York has remained steady all the month with very slight fluctuations, closing at 4.72½ New York and around 4.55 to 4.57½ East St. Louis. The exports of zinc ore during the month amounted to 2,058 tons.

ANTIMONY.—There has been no material change in the foreign antimony market, the price ruling in America being a shade below the foreign cost of import.

The New York antimony market has been very dull with prices unchanged. Cooksons 8.00 to 8.25, Halletts 7¾ to 7⅞, with the other grades around 7⅜ to 7½ cents.

ALUMINUM.—There is no change in the prices of aluminum. 99% pure ingots 32 cents, with rods, wire and sheets base price unchanged.

SILVER.—The London silver market has ruled dull and easier with a decline of ¾d. for the month, closing at 23⅝.

In the New York silver has followed the decline abroad and values here are about ½ cent per ounce lower than a month ago, closing at 51⅛ cents.

SHEET METALS.—There has been no change in the base price of sheet copper, or copper wire or brass sheets or rods, but the demand has not been as active as the active copper market warranted.

OLD METAL.—The old metal market has been rather more active and prices have fluctuated slightly in sympathy with the more active copper market, at the close the market is dull and consumers are inclined to hold off.

THE AUGUST MOVEMENTS IN METALS

	Highest.	Lowest.	Average
COPPER—			
Lake	14.00	13.50	13.75
Electrolytic	13.90	13.30	13.50
Casting	13.50	13.00	13.25
TIN	31.00	28.90	29.90
LEAD	4.60	4.55	4.60
SPELTER	4.75	4.70	4.75
ANTIMONY (Halletts)	8.00	7.85	7.90

See Advertising Pages 21 and 22 Following for Trade Wants

Metal Prices, September 14, 1908

NEW METALS.

	Price per lb.
COPPER, PIG, BAR AND INGOT AND OLD COPPER.	
Duty Free. Manufactured 2½c. per lb.	
Lake, car load lots	13.85
Electrolytic, car load lots	13.75
Castings, car load lots	13.50
TIN—Duty Free.	
Straits of Malacca, car load lots	28.90
LEAD—Duty Pigs, Bars and Old, 2½c. per lb., pipe and sheets, 2½c. per lb.	
Pig lead, car load lots	4.60
SPELTER—Duty 1½c. per lb.	
Western, car load lots	4.75
ALUMINUM—Duty Crude, 8c. per lb. Plates, sheets, bars and rods, 13c per lb.	
Small lots	34.00
100 lb. lots	33.00
Ton lots	32.00
ANTIMONY—Duty ¾c. per lb.	
Cookson's cask lots, nominal	8.00
Hallett's, cask lots	7.75
Other cask lots	7.40 to 7.50
NICKEL—Duty, 6c. per lb.	
Shot, Plaquettes, Ingots, Blocks, according to quantity	45 to .60
MANGANESE—Duty 20%	.80
MAGNESIUM—Duty free	$1.30
BISMUTH—Duty free	1.80
CADMIUM—Duty free	1.40
	Price per oz.
GOLD—Duty free	$20.67
SILVER—Duty Free	.51¼
PLATINUM—Duty Free	19.25
QUICKSILVER—Duty 7c. per lb. Price per pound	60c. to 61c.

OLD METALS.

	Price per lb.	
Heavy Cut Copper	11.50	12.00
Copper Wire	11.00	11.75
Light Copper	10.00	10.50
Heavy Mach. Comp.	10.50	11.00
Heavy Brass	8.00	9.00
Light Brass	6.00	6.50
No. 1 Yellow Brass Turnings	7.50	8.00
No. 1 Comp. Turnings	8.50	9.00
Heavy Lead	4.00	4.20
Zinc Scrap	**3.00**	**3.50**
Scrap Aluminum, turnings	6.50	7.00
Scrap Aluminum, cast, alloyed	15.00	18.00
Scrap Aluminum, sheet (new)	20.00	21.00
Old Nickel, solid	20.00	23.00
No. 1 Pewter	**18.00**	**19.00**

INGOT METALS.

	Price per lb.
Silicon Copper ..... according to quantity	30 to 38
Phosphor Copper, 5% ..... " "	19 to 21
Phosphor Copper, 10% to 15% Guaranteed ..... " "	28 to 30
Phosphor Tin ..... " "	34 to 36
Brass Ingot, Yellow ..... " "	10 to 11
Brass Ingot, Red ..... " "	12 to 14
Bronze Ingot ..... " "	11 to 13
Manganese Bronze ..... " "	14 to 17
Phosphor Bronze ..... " "	13 to 16
Casting Aluminum Alloys ..... " "	29 to 35

PHOSPHORUS—Duty 18c. per lb.
According to quantity ..... 32 to 40

PRICES OF HOT ROLLED SHEET COPPER.

SIZES OF SHEETS.		64 oz. and over 50 lb. sheet 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 50 lbs. sheet 30 x 60.	24 oz. to 32 oz. 18¾ to 25 lb. sheet 30 x 60.	16 oz. to 24 oz. 12½ to 18¾ lb. sheet 30 x 60.	14 oz. and 15 oz. 11 to 12½ lb. sheet 30 x 60.	12 oz. and 13 oz. 9½ to 11. lb. sheet 30 x 60.	10 oz. and 11 oz. 7¾ to 8½ lb. sheet 30 x 60.	8 oz. and 9 oz. 6¼ to 7¾ lb. sheet 30 x 60.	Lighter than 8 oz.
		CENTS PER POUND.								
Not wider than 30 ins.	Not longer than 72 inches.	18	18	18	18	19	20	21	24	27
	Longer than 72 inches. Not longer than 96 inches.	18	18	18	18	19	21	24	27	
	Longer than 96 inches.	18	18	18	18	20	24			
Wider than 30 ins. but not wider than 36 inches.	Not longer than 72 inches.	18	18	18	18	20	22	25	28	
	Longer than 72 inches. Not longer than 96 inches.	18	18	18	18	20	24	27		
	Longer than 96 inches. Not longer than 120 inches.	18	18	18	19	21				
	Longer than 120 inches.	18	18	19	20					
Wider than 36 ins. but not wider than 48 inches.	Not longer than 72 inches.	18	18	19	20	22	25	28		
	Longer than 72 inches. Not longer than 96 inches.	18	18	19	21	23	26			
	Longer than 96 inches. Not longer than 120 inches.	18	18	20	22	26				
	Longer than 120 inches.	18	19	21	24					
Wider than 48 ins. but not wider than 60 inches.	Not longer than 72 inches.	18	18	19	21	24	29			
	Longer than 72 inches. Not longer than 96 inches.	18	18	20	22	27				
	Longer than 96 inches. Not longer than 120 inches.	18	19	21	24					
	Longer than 120 inches.	19	20	22	26					
Wider than 60 ins. but not wider than 72 ins.	Not longer than 96 inches.	18	19	21	26					
	Longer than 96 inches. Not longer than 120 inches.	18	20	23	28					
	Longer than 120 inches.	19	21	26						
Wider than 72 ins. but not wider than 108 ins.	Not longer than 96 inches.	19	21	24						
	Longer than 96 inches. Not longer than 120 inches.	20	22	25						
	Longer than 120 inches.	21	23	27						
Wider than 108 ins.	Not longer than 132 inches.	22	24							
	Longer than 132 inches	23	26							

Rolled Round Copper, ⅝ inch diameter or over 18 cents per pound. (Cold Drawn, Square and Special Shapes, extra.)

Circles, Segments and Pattern Sheets three (3) cents per pound advance over prices of Sheet Copper required to cut them from.

All Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, one (1) cent per pound over the foregoing prices.

All Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, two (2) cents per pound over the foregoing prices.

Cold Rolled and Annealed Copper, Sheets and Circles, take the same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness.

All Polished Copper, 20 inches wide and under, one (1) cent per pound advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 inches wide, two (2) cents per pound advance over the price for Cold Rolled Copper.

Planished Copper, one (1) cent per pound more than Polished Copper.

Cold Rolled Copper prepared suitable for polishing, same prices and extras as Polished Copper.

Tinning Sheets, on one side, 3½c. per square foot.

For tinning both sides, double the above price.

For tinning the edge of sheets, one or both sides, price shall be the same as for tinning all of one side of the specified sheet.

COPPER BOTTOMS, PITS AND FLATS.

14 oz. to square foot and heavier, per lb.	22c.
12 oz. and up to 14 oz. to square foot, per lb.	23c.
10 oz. and up to 12 oz.	25c.
Lighter than 10 oz.	28c.

Circles less than 8 in. dia., 2c. per lb. additional.
Circles over 13 in. dia. are not classed as Copper Bottoms
Polished Copper Bottoms and Flats, 1c. per lb. extra.

ZINC—Duty, sheet, 2c. per lb.	Price per lb.
Mill price, carload lots	7.00 less 8%
Open casks	8.50

Metal Prices, September 14, 1908

PRICES ON BRASS MATERIAL—MILL SHIPMENTS.

In effect Aug. 10, 1908, and until further notice.

To customers who purchase less than 40,000 lbs. per year and over 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.14½	$0.16½	$0.18½
Wire	.14½	.16¾	.18¾
Rod	.14½	.16¾	.19¾
Brazed tubing	.20¾	——	.23½
Open seam tubing	.18¾	——	.21½
Angles and channels, plain	.20¾	——	.24¾

30% discount from all extras as shown in American Brass Manufacturers' Price List No. 7.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass..	¾c.	per lb.	net	advance.
" —Best spring, drawing and spinning brass....	1½c.	"	"	"
Wire—Extra spring and brazing wire.....	¾c.	"	"	"
" —Best spring and brazing wire.....	1c.	"	"	"

To customers who purchase less than 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.15¼	$0.17½	$0.19½
Wire	.15½	.17¾	.19¾
Rod	.15½	.17¾	.20¾
Brazed tubing	.21¾	——	.24½
Open seam tubing	.19¾	——	.22½
Angles and channels, plain	.21¾	——	.25¾

5% discount from all extras as shown in American Brass Manufacturers' Price List No. 7.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass..	¾c.	per lb.	net	advance.
" —Best spring, drawing and spinning brass....	1½c.	"	"	"
Wire—Extra spring and brazing wire.....	¾c.	"	"	"
" —Best spring and brazing wire.....	1c.	"	"	"

BARE COPPER WIRE—CARLOAD LOTS.

15¼c. per lb. base.

SOLDERING COPPERS.

300 lbs. and over in one order	18c.	per lb. base.
100 lbs. to 300 lbs. in one order	18½c.	" " "
Less than 100 lbs. in one order	20c.	" " "

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ to 3½ in. O. D. Nos. 4 to 13 Stubs' Gauge, 18c. per lb.
Seamless Copper Tubing, 21c. per lb.

For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes.

Iron Pipe Size.	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb.	26	25	20	19	18	18	18	18	18	18	18	19	20	22	24	25

PRICE LIST OF IRON LINED TUBING—NOT POLISHED.

	Per 100 feet— Brass.	Bronze.
⅜ inch	$8	$9
½ inch	8	9
⅝ inch	10	11
¾ inch	12	13
⅞ inch	14	15
1 inch	18	20
1¼ inch	22	24
1½ inch	25	27
1½ inch	32	35
1¾ inch	45	48
2 inch	56	60

Discount 45 and 5%.

PRICES FOR MUNTZ METAL AND TOBIN BRONZE.

Muntz or Yellow Metal Sheathing (14" x 48")	15c.	lb. net base
" " " Rectangular Sheets other than Sheathing	17c.	" " "
" " " Rod	16c.	" " "
Tobin Bronze Rod	17c.	" " "

Above are for 100 lbs. or more in one order.

PLATERS' METALS.

Platers' bars in the rough, 23½c. net.

German silver platers' bars dependent on the percentage of nickel, quantity and general character of the order.

Platers' metal, so called, is very thin metal not made by the larger mills and for which prices are quoted on application to the manufacturers.

PRICES FOR SHEET BLOCK TIN AND BRITANNIA METAL.

Not over 18 in. in width, not thinner than 23 B. S. Gauge, 4c. above price of pig tin in same quality.

Not over 35 in. in width, not thinner than 22 B. S. Gauge, 5c. above price of pig tin.

PRICE LIST FOR SHEET ALUMINUM—B. & S. Gauge.

Wider than..... and including.....	3in. 12in. in coils.	6in. 14in.	14in. 16in.	16in. 18in.	18in. 20in.	20in. 24in.	24in. 30in.	30in. 36in.	36in. 40in.
No. 13 and heavier	40	40	42	42	42	42	45	45	45
" 14	40	40	42	42	42	42	45	45	45
" 15	40	40	42	42	42	42	45	45	45
" 16	40	40	42	42	42	42	45	45	45
" 17	40	40	42	42	42	42	45	45	45
" 18	40	40	42	42	42	42	45	45	45
" 19	40	40	42	42	42	42	45	46	49
" 20	40	42	42	42	42	44	47	48	50
" 21	40	44	44	44	44	46	49	50	56
" 22	40	44	44	44	46	46	49	53	57
" 23	40	44	44	44	46	46	49	55	58
" 24	40	44	46	48	48	48	51	57	60
" 25	42	45	47	49	49	49	52	59	63
" 26	42	45	48	52	52	52	57	61	67
" 27	42	46	50	54	54	55	60	64	70
" 28	42	46	52	54	55	55	62	68	73
" 29	44	47	54	56	58	58	67	73	78
" 30	44	48	56	58	62	68	76	78	83
" 31	40	53	61	64	69	77	80	83	89
" 32	51	55	63	67	75	83	90	96	101
" 33	53	57	66	71	79	90	97	106	116
" 34	56	61	68	76	84	97	109	116	126
" 35	..	71	76	86	96	106	121	131	..
" 36	..	86	96	106	121	126	141	..	..
" 37	...	110	114	135	150	165	180	..	..
" 38	..	130	145	160	175	190	210	..	..
" 39	..	150	170	190	210	230	..	..	..
" 40	..	180	210	230	250	..	..	..	..

In flat rolled sheets the above prices refer to lengths between 2 and 8 feet. Prices furnished by the manufacturers for wider and narrower sheet. All columns except the first refer to flat rolled sheet. Prices are for 50 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

PRICE LIST OF SEAMLESS ALUMINUM TUBING.

Stubs' G. B. & S. G.	1¼"	1½"	1¾"	2"	2¼"	2½"	2¾"	3"	3¼"	3½"	3¾"	4"	4¼"	4½"
4 to 11	3 to 9	BASE PRICE 50 CENTS.										3	3	3	10
12	10											6	6	6	13
13	11											10	10	10	16
14	12	3	3	3	3	3	3	3	3	3	3	13	13	13	19
15	13	3	3	3	5	3	3	3	5	3	3	19	19	19	22
16	14	6	6	6	6	6	6	6	6	6	16	19	22	25	35
17	15	10	10	10	10	10	10	10	10	16	19	22	25	29	38
18	16	13	13	13	13	13	13	13	19	22	25	29	32	32	44
19	17	16	16	16	16	16	16	22	25	29	32	35	41	48	54
20	18-19	19	19	19	19	19	22	22	25	29	35	35	41	60	60
21	20	22	22	22	22	22	..	..	..	..	..	..	..	..	..
22	21	25	25	25	25	25	..	..	..	..	..	..	..	..	..
23	22	35	35	35	41	48	..	..	..	..	..	..	..	..	..
24	23	57	60	60	63	67	..	..	..	..	..	..	..	..	..
25	24	73	76	..	..	..	..	..	..	..	..	..	..	..	..

Prices are for ten pounds or more at a time. For prices on smaller sizes send for manufacturers' list.

PRICE LIST FOR ALUMINUM ROD AND WIRE.

Diameter. B. & S. G'ge.	000 to No. 10.	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21.	No. 22.
Price, per lb....	38	38½	38½	39	39½	40	40½	41	42	43	44	47	52

200 lbs. to 30,000 lbs., 3 cents off list; 30,000 lbs. and over, 4 cents off list.

PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12	$0.52	16	$0.58
13	.53	17	.59
14	.54	18	.60
15	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive, American or Brown & Sharpe's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 50%.

GERMAN SILVER TUBING.

4	per cent.	to No. 19, B. & S. Gauge, inclusive			$0.60
6	"	" 19,	"	"	.70
9	"	" 19,	"	"	.85
12	"	" 19,	"	"	1.00
15	"	" 19,	"	"	1.15
16	"	" 19,	"	"	1.20
18	"	" 19,	"	"	1.30

German Silver Tubing thinner than No. 19 B. & S. Gauge add same advances as for Brazed Brass Tube.

For cutting to special lengths add same advances as for Brazed Brass Tube. Discount 40%.

PRICE OF SHEET SILVER.

Rolled sterling silver .925 fine is sold according to gauge quantity and market conditions. No fixed quotations can be given as prices range from 2c. below to 6c. above the price of bullion.

Rolled silver anodes .999 fine are quoted at 2c. above the price of bullion.

TRADE WANTS

AN EXCHANGE FOR THE WANTS OF THE METAL TRADES.

Advertisements will be inserted under this head at 40 cents per line, 3 lines one dollar, for each insertion, excepting Situations Wanted, 20 cents per line, 3 lines half a dollar. Answers sent in our care will be forwarded.

METALS, MACHINERY AND SUPPLIES FOR SALE

FOR SALE

A fully equipped JOB PLATING and HARDWARE SPECIALTY MANUFACTURING plant, in an Eastern Pennsylvania city of 100,000.

$5,000.00 job plating annually (can be doubled). A thoroughly established trade on HARDWARE SPECIALTIES in the United States and FOREIGN, at good profits.

Working full time with orders on hand.

VERY GOOD reasons for selling. January 1st, 1908, stock account showed $6,000.00; will sell for less to quick buyer. A splendid opportunity to get a good ESTABLISHED, fully EQUIPPED and MANNED business for less than cost. Address,

OPPORTUNITY, care The Metal Industry

FOR SALE

The license, good will, patterns and tools of a

NEW AND PATENTED VALVE.

A good opportunity for anyone wishing to enter the field or add to their present business.

Address N. P., care of THE METAL INDUSTRY.

FOR SALE

One No. 275 Steele-Harvey Metal Melting Furnace.

Same was built a little over a year ago, but has never been used. For further information address

STEELE-HARVEY, care THE METAL INDUSTRY

FOR SALE

TWO HILL CRUSHERS

For crushing brass ashes and skimmings, slightly used, guaranteed to be in good condition.

Address METALS.
Care THE METAL INDUSTRY, 61 Beekman Street, New York.

We have for sale a

SECOND HAND PLATING DYNAMO

on account of same being too small for our work:

One 6 volt Card Machine rated at 700 amperes, cost $350.00, new, 8 years ago **for sale at $80.00**

F. O. B. PERU, ILL.

AMERICAN NICKELOID & MFG. CO., Peru, Ill.

FOR SALE—A PHOENIX PLATING DYNAMO; 6 volts, 3,000 amperes; direct connection to 33 H. P. 230 volt direct current motor; in good working condition. Address BOX W., care THE METAL INDUSTRY.

FOR SALE—AT A SACRIFICE, A BRICK FOUNDRY FACTORY with all of the machinery for smelting. Located at Utica, N. Y. For further information inquire of SAMUEL ELLIS, 322 Canal street, New York City.

FOR SALE—A lot of new SHEET BRASS and ALUMINUM at a bargain. WALSH'S SONS & CO., Newark, N. J.

FOR SALE—LATHES and DRILL CHUCKS, Face Plate Jaws, Centering Chucks, Planer Chucks, etc. Immediate shipment guaranteed. Address LATHE CHUCK, care THE METAL INDUSTRY.

METALS, MACHINERY AND SUPPLIES WANTED

We PAY CASH for GOLD, SILVER and PLATINUM SCRAPS, SOLUTIONS and SWEEPINGS; Old Nickel Anodes, New or Old Mercury, Bismuth, Gas Mantle Dust and Chemicals, etc. EMPIRE CHEMICAL WORKS, 416 East 52d street, New York City.

CASH PAID for old precious metals and minerals in any form. Gas mantle dust, bronze powder, bismuth, platinum, mercury, nickel, etc. Address JOSEF RADNAI, 36 Fulton St., New York City.

WANTED—METALS and WASTE of all kinds. Address WALSH'S SONS & CO., Newark, N. J.

OPPORTUNITIES

BRASS FOUNDERS.

TO RENT.

Complete foundry, Brooklyn, including nickel plating plant, 3,600 square feet, first loft and 7 horse power at $125 a month, additional horse power up to 50, $35.00 per horse. Shipping facilities excellent, light four sides, 34 windows, dimensions nickel plating plant, 12' x 18' x 60' including use of two furnaces and core oven and other machinery. Can give immediate occupancy. Bargain.

Address "F," care The Metal Industry, 61 Beekman St., New York

BRASS FOUNDERS

Practical information bureau, 40 years' experience with trade secrets, from the furnace to the finisher. Work in all known metals, from common brass to the secret process of tempering copper. 40 formulas, worth a thousand dollars.

PREPAID TO ANY ADDRESS ON RECEIPT OF FIVE DOLLARS.

JAMES ALLEN

2552 J Street, : : : SAN DIEGO, CAL.

WANTED—To correspond with Mr. Brown, of St. Louis regarding worn-out buffs. Address, BUFI'S, care THE METAL INDUSTRY.

WANTED—To correspond with firms who will clean and separate a quantity of brass chips, oily and dirty, mixed with babbitt. Address BRONZE CHIPS, care THE METAL INDUSTRY.

WANTED—To correspond with COPPER ROLLING MILLS who can furnish COPPER PLATES for Half-Tone Etchers. Also POLISHING FIRM who can finish the above plates. Address, COPPER, care THE METAL INDUSTRY.

J. P. FANNING, Machinist, 678 Jefferson Avenue, Brooklyn, N. Y.—Maker of Moulds for Casting Solder, Babbitt Metal, Bar Lead, etc. We also manufacture small work. Write for particulars.

WANTED—To purchase or work on royalty articles relating to modern foundry equipment, which will guarantee economy and a saving of labor over present methods. Forward blue prints or patterns. Address, BLUE PRINTS, care THE METAL INDUSTRY.

WANTED—Concerns handling Platers' and Publishers' Supplies to represent a large manufacturing concern of ALKALIS. Address with full particulars, territories covered and number of men selling goods. Address ALKALI, F-7, care THE METAL INDUSTRY.

WANTED—Reliable parties to canvass for subscriptions to THE METAL INDUSTRY. Liberal commission. For further particulars address THE METAL INDUSTRY, 61 Beekman street, New York.

GOOD SALES, GOOD EQUIPMENT, GOOD ASSISTANTS and GOOD POSITIONS may be obtained by the insertion of a METAL INDUSTRY WANT.

Inquiries received by THE METAL INDUSTRY for Metals, Machinery and Supplies. Further particulars may be obtained by addressing the inquiry number, care THE METAL INDUSTRY.

Inquiry No. 27.—Would like to hear from firms who manufacture metallic magnesia or alloys used in strengthening aluminum.

Inquiry No. 28.—Would like to hear from firms who buy white metal and aluminum scraps.

Inquiry No. 29.—Would like to hear from firms making oil-burners which can be installed in regular coal-burning brass furnaces.

Inquiry No. 30.—Would like to hear from firms who manufacture elevator or hoisting machinery, especially hydraulic or plunger systems.

SITUATIONS OPEN

WANTED—A man capable of designing and superintending the manufacture of high grade ELECTRIC LIGHT FIXTURES, or taking an active part in getting out ORNAMENTAL IRON WORK, also ORNAMENTAL GRILL and BANK FIXTURE work in BRASS, IRON and WIRE. We have a good sized shop with good facilities and would like to hear from a good plating man who understands this line of work. Address TEXAS, care THE METAL INDUSTRY.

WANTED—By a firm making CHANDELIERS, a FOREMAN to take charge of Gas Cock, Jig Drilling and Screw Machine Department. Address CHANDELIERS, care THE METAL INDUSTRY.

TRADE WANTS

AN EXCHANGE FOR THE WANTS OF THE METAL TRADES.

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SITUATIONS OPEN—Cont'd.

WANTED—A first-class NICKEL-PLATED and POLISHER to work on coffee urns. Wages $25.00 per week. Address, S-1, care THE METAL INDUSTRY.

WANTED—A good man to take charge of our POLISHING, PLATING and LACQUERING DEPARTMENT. Must be an up-to-date man, able to handle help to the best advantage and up to modern ways of turning out work. To such a man we would make a good offer. Address, S-2, care THE METAL INDUSTRY.

WANTED—A thoroughly experienced and competent METAL MIXER and melter for brass founory; prefer a man with both theoretical and practical knowledge of chemistry and metallurgy; must be capable of going into the foundry personally and producing satisfactory results. Address A. W. L., care THE METAL INDUSTRY.

WANTED—A FOREMAN for Metal Novelty Manufactury. One who has had several years' experience, supervising the manufacturing of plated and decorated novelties, such as pin trays, toilet articles, photo-frames, hatpins, writing desk sets and similar articles. Write fully, stating previous connections and nature of their products; number of employees overseen; age, married or single; salary desired; references. Big chance for future for the right man. Address, METAL NOVELTIES, care THE METAL INDUSTRY.

WANTED—WORKING FOREMAN for PLATING ROOM. Must be familiar with coloring gold, silver, brass, nickel, oxidizing, etc. Steady work guaranteed to right man. A splendid opportunity. Address, WORKING FOREMAN, care THE METAL INDUSTRY.

WANTED—A Working Foreman for Plating Room. We manufacture builders' hardware and the man to fill the position for us would require to be thoroughly competent to take full charge, and produce any desired finish. Address J-4, care THE METAL INDUSTRY.

WANTED—To correspond with some high-class salesmen calling on the large FOUNDRY trade throughout different parts of the country who could handle our LUMBER on a commission basis as a side line. For further particulars address LUMBER, care THE METAL INDUSTRY.

SITUATIONS WANTED

Advertisements under this head will be inserted for 20 cents per line, 3 lines for Half a Dollar.

SITUATION WANTED—By a SALESMAN of executive ability. Thirty-four years old with wide experience and acquaintance among the largest factories (FOUNDERS) in Chicago. Can furnish the best of references. Can sell your line in connection with what I have. Address, S-5, care THE METAL INDUSTRY.

SITUATION WANTED—By a first-class PLATER and POLISHER who can furnish the best of reference. Capable of taking charge of PLATING and POLISHING DEPARTMENTS. Address, PETER FASCINELLA, 266 E 154th street, New York City.

SITUATION WANTED—By a BRASS MOLDER with over 16-years' experience. Willing to go to any town or city. Can furnish the best of reference. Address, S-6, care THE METAL INDUSTRY.

SITUATION WANTED—By a first-class ELECTRO-PLATER. Brass solutions a specialty, also Gold, Silver, Nickel and antique finishes. Can furnish the best of references. Address, L. H. care THE METAL INDUSTRY.

SITUATION WANTED—By a BRASS FOUNDRY FOREMAN thoroughly familiar with green and dry sand work. Experienced in mixing metals, handling machines and up-to-date methods of running a foundry. Can furnish the best of references. Address, S-7, care THE METAL INDUSTRY.

SITUATION WANTED—COLORER and PLATER on JEWELRY wishes a position. Can also do all kinds of plating. Address, M. A. SWARTZ, 219 E 79th street, New York City.

SITUATION WANTED—By a first-class PLATER who wishes to change position. Expert on BRASS SOLUTIONS. Address, S-3, care THE METAL INDUSTRY.

SITUATION WANTED—By a TOOL-MAKER who is thoroughly reliable with 18-years' experience on tools for BRASS VALVES and PLUMBING GOODS. Can furnish the best of references. Address, S-4, care THE METAL INDUSTRY.

SITUATION WANTED—By a PLATER who is thoroughly familiar with GOLD, SILVER and all finishes. Have had experience in deposit work. Married man, 38 years of age. Address, CYANIDE, care THE METAL INDUSTRY.

SITUATION WANTED.—Competent chaser and Repousée Worker. Also understands etching and general work. Not afraid to work. Address T. T. S., care METAL INDUSTRY.

SITUATION WANTED—By FOREMAN ELECTRO-PLATER, with wide experience in plating Gold, Silver, Nickel, Brass, Bronze and Copper on all metals, including Barrel Plating. Can instal plants. Address R. F. C., care THE METAL INDUSTRY.

SITUATION WANTED—By FIRST CLASS PLATER AND POLISHER. Has had 16 years' experience and had charge of men for the last 10 years. Can handle any kind of a plant, understands all finishes and can give good reference. Address F-6, care THE METAL INDUSTRY.

SITUATION WANTED—CHEMIST AND METALLURGIST, University Graduate of wide practical experience with some capital would like to engage in partnership with some reliable firm. Address RADIUM, care THE METAL INDUSTRY.

SITUATIONS WANTED—Cont'd.

SITUATION WANTED—By an expert on making ALUMINUM CASTINGS. Can make the strongest and lightest castings on the market. Address, ALUMINUM, care THE METAL INDUSTRY.

SITUATION WANTED—Have had years of good, practical experience in all branches of the BRASS and COPPER business, thoroughly familiar with New York City trade, and would like to connect with some good house as their representative. Address L. J. W., care THE METAL INDUSTRY.

SITUATION WANTED—By a PRACTICAL PLATER who thoroughly understands all kinds of finishes on all kinds of metals. California position preferred. Address H. P., care THE METAL INDUSTRY.

SITUATION WANTED—By a PLATER who has had 17 years experience in the HARDWARE line. Address B. H. care THE METAL INDUSTRY.

SITUATION WANTED—By a foreman of NICKEL PLATING, BUFFING and POLISHING DEPARTMENTS. Have had many years experience and can furnish the best of reference. Address R. D. A., care THE METAL INDUSTRY.

SITUATION WANTED—By a BRASS FOUNDER with all the old and new methods of molding. Can furnish the best of reference. Address J. A., care THE METAL INDUSTRY.

SITUATION WANTED—By a First Class Plater with several years experience. Can furnish the best of references. Address A. J. H., care THE METAL INDUSTRY

SITUATION WANTED—Position as Foundry Foreman or Superintendent in brass. Have had twenty years' experience and can give the best of references. Do my own mixing. Address F. B. M., care THE METAL INDUSTRY.

SITUATION WANTED—By two DIE SINKERS wishing to make a change together or separate. Wide experience on flat, hollow ware and jewelry, etc., willing to go anywhere. Address J-8, care THE METAL INDUSTRY.

SITUATION WANTED.—By a plater on Gold, Silver, Black Nickel, Brass, Bronze and Tin. Plating Verde Green, Oxidizing. Address T. J. care THE METAL INDUSTRY.

SITUATION WANTED—By a Plater, Polisher and Buffer. First-class all around man. Expert in all solutions and finishes, silver deposit, galvana plastic, cold galvanizing. Eighteen years' experience in Electro Metallurgy. Address J-10, care THE METAL INDUSTRY.

SITUATION WANTED—By PLATER thoroughly conversant with Bronze, Brass, Copper and Nickel Plating, their oxidizes and finishes. Can furnish best of references. Address BOX NO. 6, care THE METAL INDUSTRY.

SITUATION WANTED—By PLATER with 28 years' experience in all metals, including platinum. Should be glad to hear from firms desiring the services of a first class plater. Address BOX NO. 8, care THE METAL INDUSTRY.

HAVE YOU A WANT ?

¶ Let it be known in THE METAL INDUSTRY Trade Wants, and you will get what you want

¶ Our Want Ad. page is a regular exchange for supplying the immediate wants of the Metal Trades

¶ The cost is 40 cents per line, three lines for One Dollar. Answers sent in our care will be forwarded

DIRECTORY

METAL ROLLING MILLS.

INGOT, SHEET, ROD, WIRE AND TUBING.

HENDRICKS BROTHERS
Manufacturers of
Sheet and Bar Copper
COPPER FIREBOX PLATES
and STAYBOLTS
WIRE and BRAZIER'S RIVETS
IMPORTERS AND DEALERS IN
INGOT COPPER, BLOCK TIN,
SPELTER, LEAD, ANTIMONY
BISMUTH, NICKEL, Etc.
49 Cliff Street, NEW YORK

Established 1802 Cable Address: "Scovill"
SCOVILL MFG. CO.
WATERBURY, CONN.
THE LARGEST AND MOST FULLY EQUIPPED BRASS ROLLING MILLS AND METAL GOODS MANUFACTURING ESTABLISHMENT IN THE WORLD
Estimates for Specialties in Brass, German Silver and Aluminum furnished on application. DEPOTS:
NEW YORK: 75 Spring St. BOSTON: 170 Summer St. CHICAGO: 210 Lake St.

WATERBURY BRASS CO.
General Offices, Mills and Factories.
Waterbury, Conn.
NEW YORK OFFICE, 99 JOHN STREET.
Providence (R. I.) Store, 131 Dorrance St.
Shipments Upon Receipt of Order
From Large Stock of
SEAMLESS DRAWN BRASS AND COPPER TUBING
BRASS { SHEET ROD WIRE
COPPER { SHEET ROD WIRE
GERMAN SILVER { SHEET ROD WIRE
AT WATERBURY

Non-Corrosive — Finest Quality
COPPER AND YELLOW
(Muntz) Metal
Naval Brass
Naval Bronze
Manganese Bronze
Plates, Sheets, Bolts, Bars, Rods, Nails, Tacks, &c.
Taunton-New Bedford Copper Co.
NEW BEDFORD, MASS.
17 Water St., New York — 61 Batterymarch St., Boston

C. G. HUSSEY & CO.
PITTSBURGH, PENNA.
Manufacturers of
COPPER
In Sheets, Plates, Rolls
ANODES
Tacks and Nails

Bridgeport Brass Co.
BRIDGEPORT, CONN.
Postal Telegraph Building,
Broadway and Murray St, New York
17 N. 7th Street, Philadelphia
Manufacturers of
Brass and Copper { Sheet Tubing Wire and Rods.
Metal Goods Made to Order from Sheet, Rod, Wire and Tubing

BRASS and COPPER in Sheets and Rolls
SILVER PLATED METAL (for Coach Lamps)
BRITANNIA METAL
B. & M. BABBITT METAL for Bearings
LINING METAL for Automobile Bearings and Copper for Electrical Purposes
H. K. & F. S. BENSON
GLEN RIDGE, N. J.

THE SEYMOUR MFG. CO.
SEYMOUR, CONN.
German Silver
BRASS, COPPER and BRONZE IN SHEETS, WIRE, RODS and TUBES
COPPER AND NICKEL ANODES
Resistance Wires, Fuse Wire, Solder Wire, Shot Copper, Nickel Wire, Spark Plug Wire.

The Ansonia Brass and Copper Co.
99 John St. New York
MANUFACTURERS OF
BRASS and COPPER Sheets, Tubes, Rods and Wire
SOLE MANUFACTURERS TOBIN BRONZE
(Trade-Mark Registered)

THE PILLING BRASS CO.
WATERBURY, CONN.
Brass and German Silver
6 in. and narrower
.005 and thinner
PLATERS' METAL A SPECIALTY

THIS SPACE FOR SALE
Send for Rates

THIS SPACE FOR SALE
Send for Rates

Baltimore Copper Smelting and Rolling Company
BALTIMORE, MARYLAND
SHEET COPPER

"RIVERSIDE" German Silver
Phosphor Bronze
Sheets, Rods, Wire, Ingots, Castings, Jewelers' Bars and Alloys
The Riverside Metal Co.
Riverside, Burlington Co., N. J.

ELEPHANT BRAND
DELTA
REG. U. S. PAT. OFF.

THE PHOSPHOR BRONZE SMELTING CO., Limited.
2200 WASHINGTON AVENUE, PHILADELPHIA, PA.
ELEPHANT BRAND "Phosphor Bronze"
INGOTS, CASTINGS, WIRE, RODS, SHEETS, Etc.
— DELTA METAL —
CASTINGS, STAMPINGS AND FORGINGS
ORIGINAL AND SOLE MAKERS IN THE U. S.

METAL ROLLING MILLS.

INGOT, SHEET, ROD, WIRE AND TUBING.

THE FRENCH MFG. CO.
134 ROBBINS ST
WATERBURY, CONN
Manufacturers of
SEAMLESS
Brass, Copper, Bronze and White Metal
Thin Gauges
Small Sizes
TUBING
SPECIALTIES:
Irregular Shapes, Solid Drawn Work and Hydro-Carbon Lighting Tubing

A. H. Wells & Co.
WATERBURY, CONN.
MANUFACTURERS OF
SEAMLESS.... TUBING
NICKEL SILVER, BRASS, COPPER, BRONZE AND PURE COPPER
TUBING FOR ELECTRICAL PURPOSES
Odd and Special Shapes, and Small Tubing, a Specialty
—ALSO THE—
Bourdon Steam Gauge Springs
All sizes from 8 to 36, B. & S. Gauge.

BUFFALO TUBE CO.
255 Rano St., Buffalo, N. Y.
Manufacturers of
SEAMLESS TUBING
Brass, Copper, Bronze, German Silver
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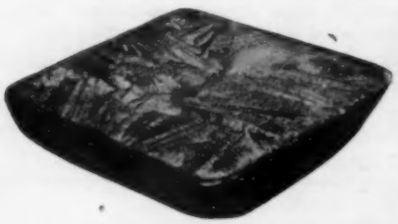

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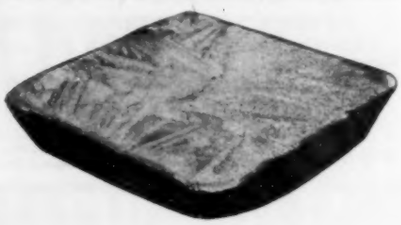

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CORE OVENS.
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Richards & Co., Boston, Mass.
Ross-Tacony Crucible Co., Philadelphia, Pa.
Seidel, R. B., Inc., Philadelphia, Pa.
Taunton Crucible Co., Taunton, Mass.
Taylor, R. J., Inc., Philadelphia, Pa.
Waterbury Crucible Co., Waterbury, Conn.

ELECTRIC FURNACES.
Bristol Co., The, Waterbury, Conn.
Hoskins Co., The, Chicago, Ill.

FIRE BRICK.
Laclede-Christy Clay Products Co., St. Louis, Mo.
Paxson, J. W., Co., Philadelphia, Pa.
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Stevens, F. B., Detroit, Mich.

FIRE SAND.
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Doggett, Stanley, New York.
Foundry Specialty Co., Cincinnati, O.
Hawley Down Draft Furnace Co., Chicago, Ill.
Hill & Griffith Co., Cincinnati, O.
Laclede-Christy Clay Products Co., St. Louis, Mo.
Paxson, J. W., Co., Philadelphia, Pa.
Shuster, F. B., Co., New Haven, Conn.
Smith Foundry Supply Co., J. D., Cleveland, O.
Stevens, F. B., Detroit, Mich.
Thompson, Lewis & Co., Inc., Phila., Pa.
Turner Machine Co., Philadelphia, Pa.

FURNACES, OIL, COAL, COKE OR GAS.
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GALVANIZING, COLD, APPARATUS.
Hanson & Van Winkle Co., Newark, N. J.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.
Zucker & Levett & Loeb Co., New York.

GALVANIZING AND TINNING FURNACES.
Rockwell Furnace Co., New York.

GAS AND GASOLINE ENGINES.
Otto Gas Engine Works, Philadelphia, Pa.

GRINDING AND POLISHING MACHINERY.
Ames Sword Co., Chicopee, Mass.
Bennett & O'Connell Co., Inc., Chicago, Ill.
Dow Chemical Mfg. Co., Mansfield, O.
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Nikolas, G. J., & Co., Chicago, Ill.

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MACHINERY, WIRE DRAWING.
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MACHINERY, WIRE FORMING.
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Dings Electro-Magnetic Separator Co., Milwaukee, Wis.
Paxson, J. W., Co., Philadelphia, Pa.

METAL MELTING FURNACES.
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METALS, NEW AND OLD.
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American Nickeloid & Mfg. Co., Peru, Ill.
Birkenstein, S., & Sons, Chicago, Ill.
Clum & Atkinson, Rochester, N. Y.
Crescent Phosphorized Metal Co., Phila., Pa.
Culbert Co., J. C., Pawtucket, R. I.
Eagle Smelting & Refining Works, New York.
Electric Smelting & Aluminum Co., Lockport, N. Y.
Ellwood Ivins Tube Works, Phila., Pa.
Globe Metal Co., Chicago, Ill.
Hagston, T. B., Co., Philadelphia, Pa.
Hazard, Coates & Bennett Co., Rochester, N. Y.
Hofeller, Theo., & Co., Buffalo, N. Y.
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Illinois Zinc Co., Peru, Ill.
J. J. Jackson Co., Newark, N. J.
Lang, R. F., New York.
Leavitt, C. W., & Co., New York.
Malta Metal Co., Rochester, N. Y.
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Richards & Co., Boston, Mass.
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¶ This deoxidizer has been thoroughly tested and pronounced A1.
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Well, Uberdam, We are mad, "RED HOT"

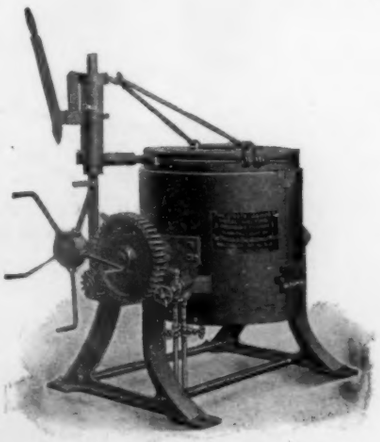
Say! Talking about sentiment, it is all rot. Now what in the dickens does it matter to you whether Mr. Wm. ——— or Wm. —— is the next President? We all know that the question is virtually settled. Well, then, why do you so-called up-to-date "BRASS FOUNDRYMEN" still procrastinate and delay placing orders for "MONARCH MODERN FURNACES"? We have your written promises that when business picks up you will order the "Steele-Harvey" furnaces. Now CONSIDER—THINK. What's going to be the consequence? We have some 500 such statements. Every foundryman, waking up at same time, all clamoring for immediate delivery—consequence, "blockade." We acknowledge our facilities for reserve stock and quick shipments are superior to others, but FAIR WARNING—first come, first served. Now, FOUNDERS, for goodness' sake, begin now to SEND IN and we will ship at ONCE, and not bother you until later about DATING INVOICES.

There is no basis for argument, nor fear of saving 50% over "coal or coke" by installing the

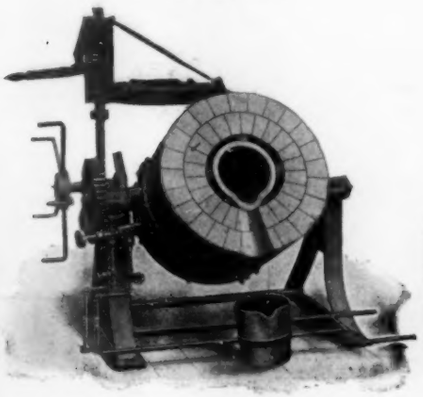
"Steele-Harvey" Crucible Tilting Melting Furnaces

(Used with Gas or Oil and Air)

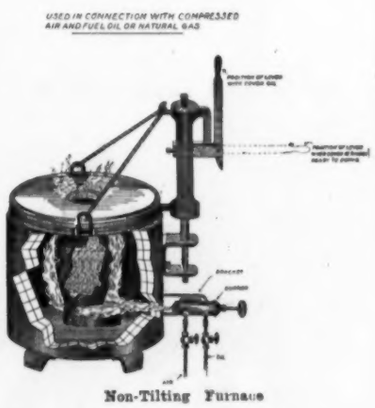
Patented Everywhere



Melting Position.



Pouring Position.



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We ALSO build Furnaces, Stationary Crucible, Tinning, Annealing, Soft Metals, Galvanizing, etc.; Ladle and Crucible Heaters, Core Oven Burners, Blowers, etc.

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ACID-RESISTING BRONZE
WHITE BRASS PHOSPHOR COPPER
CASTINGS UP TO 20,000 POUNDS IN WEIGHT.
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MANGANESE BRONZE. SPARES HYDRAULIC BRONZE
TRADE MARK
WHITE BRONZE
U. S. GOVERNMENT COMPOSITIONS.
INGOTS, FORGINGS, RODS, SHEETS.
MARINE CASTINGS & PROPELLERS.
UP TO 20,000 lbs EACH
99 JOHN STREET. NEW YORK.
CHICAGO 552 FULTON STREET PHILADELPHIA ARCADE BUILDING
CLEVELAND 1010 WILLIAMSON BUILDING BUFFALO 28 ERIE CO BANK BUILDING

ROYAL
Phosphor Copper
TWO QUALITIES:
10 or 15% Phosphorous Guaranteed
¶ This deoxidizer has been thoroughly tested and pronounced A1.
¶ The percentage of phosphorus contained is either 10% or 15%, no more, no less. If applied to the same composition results will always be the same. No blow holes and pinholes. No castings for the scrap heap.
ROYAL MANGANESE COPPER 25/30%
ROYAL SILICON COPPER 20 or 30%
ROYAL FERRO SILICON 95%
ROYAL ARSEN COPPER 50%
the latest brass flux
and other alloys
All percentages are guaranteed
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R. F. LANG
31 & 33 BROADWAY N. Y. CITY

We Can Save You Money on
SILVER-SOLDER
(FOR BRAZING, ETC.)
A tough, easy-flowing, *reliable* hard solder which we can furnish in any quantity or size at rock bottom prices. Quotations upon request
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Hartford, Conn., U. S. A.
Alloys of Precious Metals for all Purposes

TO USERS OF
White Metal Castings
Owing to a lighter demand at this season than usual for Portables and White Metal Novelties we can take on White Metal Casting Work to a limited extent in our foundry. This is an unusual chance to get high-grade castings at reasonable prices.
F. H. LOVELL & COMPANY, ARLINGTON, N. J.

NORTH AMERICAN SMELTING COMPANY
PHILADELPHIA
PHOSPHOR BRONZE AND BRASS CLIMAX BRONZE, MANGANESE BRONZE
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BABBITT, TYPE, LINOTYPE AND STEREOTYPE METALS
TINNERS' AND BRAZING SOLDERS WIRE AND TRIANGULAR SOLDERS BAR TIN LEAD AND BLOCK TIN PIPE

FOR INDEX OF ADVERTISEMENTS SEE PAGE 32

Well, Uberdam, We are mad, "RED HOT"

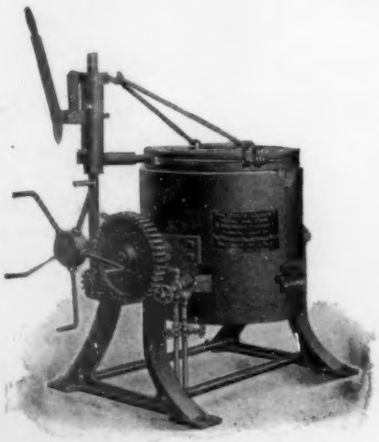
Say! Talking about sentiment, it is all rot. Now what in the dickens does it matter to you whether Mr. Wm. ——— or Wm. —— is the next President? We all know that the question is virtually settled. Well, then, why do you so-called up-to-date "BRASS FOUNDRYMEN" still procrastinate and delay placing orders for "MONARCH MODERN FURNACES"? We have your written promises that when business picks up you will order the "Steele-Harvey" furnaces. Now CONSIDER—THINK. What's going to be the consequence? We have some 500 such statements. Every foundryman, waking up at same time, all clamoring for immediate delivery—consequence, "blockade." We acknowledge our facilities for reserve stock and quick shipments are superior to others, but FAIR WARNING—first come, first served. Now, FOUNDERS, for goodness' sake, begin now to SEND IN and we will ship at ONCE, and not bother you until later about DATING INVOICES.

There is no basis for argument, nor fear of saving 50% over "coal or coke" by installing the

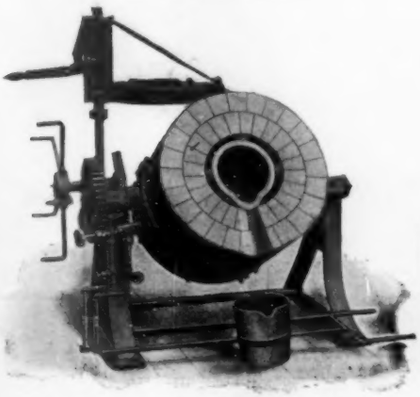
"Steele-Harvey" Crucible Tilting Melting Furnaces

(Used with Gas or Oil and Air)

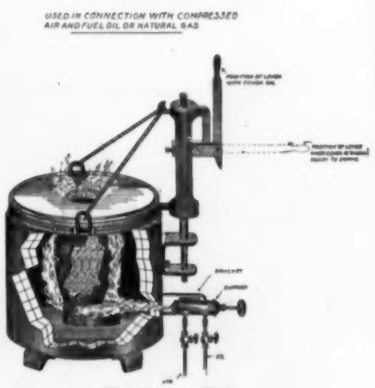
Patented Everywhere



Melting Position.



Pouring Position.



Non-Tilting Furnace

Built upon a foundation of 5 years' successful operation. NO RISK. Shipped on approval. Competent demonstrators. Sizes from No. 18 to No. 650 crucibles. Gilt-edge references everywhere.

We ALSO build Furnaces, Stationary Crucible, Tinning, Annealing, Soft Metals, Galvanizing, etc.; Ladle and Crucible Heaters, Core Oven Burners, Blowers, etc.

SHIPMENTS QUICK. PRICES LOW. SETTLEMENTS AGREEABLE.

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Furnaces for every purpose

Catalogues ? Sure !

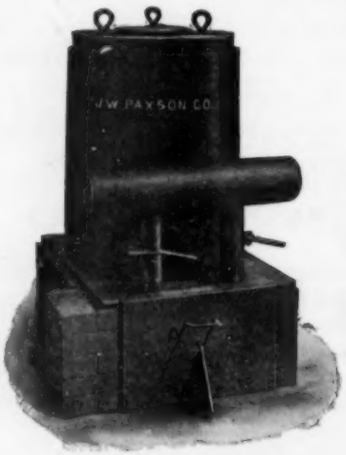

Fig. 621
Forced Draft Furnace

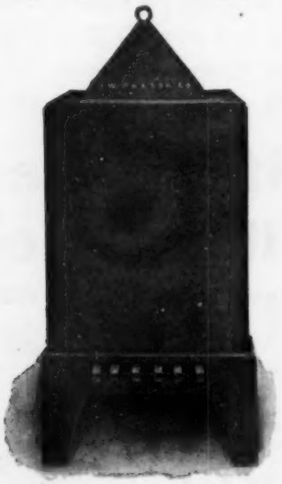

Fig. 622
Natural Draft Furnace
"SQUARE"

Fig 623
Natural Draft Furnace
"ROUND"
Also made with drop-grate, and with closed bottom to be used with forced draft

Fig. 209
Sprue Cutters. All Sizes

OUR
New Bulletin No. 18
TELLS ALL ABOUT
Molding Sand
Core Sand
Fluxing and
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For Brass Foundries

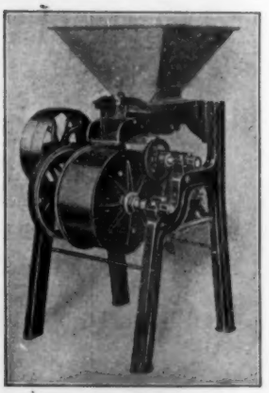


Fig. 76
The Paxson-Sawyer Magnetic Separator

J. W. PAXSON CO., PHILADELPHIA

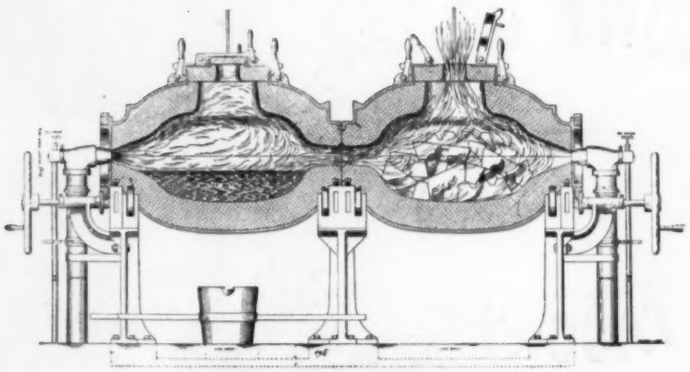
MELTING FURNACES

MANUFACTURED BY

ROCKWELL FURNACE COMPANY

26 CORTLANDT STREET, NEW YORK

WE MEET ALL CONDITIONS



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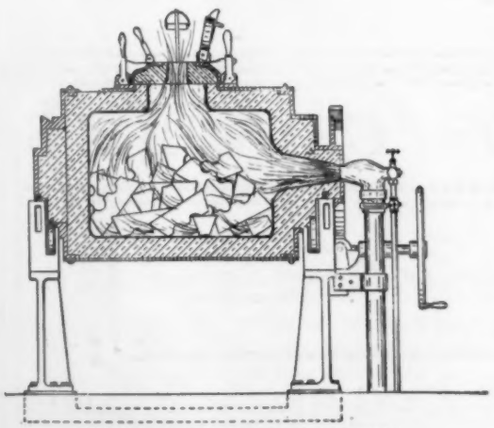

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Our new 32 page catalog of melting furnaces shows **21** different types of furnaces backed by an experience in the melting field equalled by no other concern.

Write for Catalog "M1"

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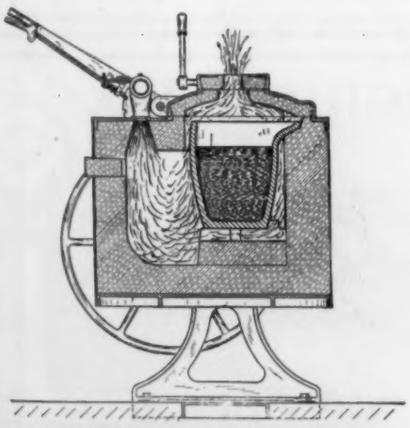

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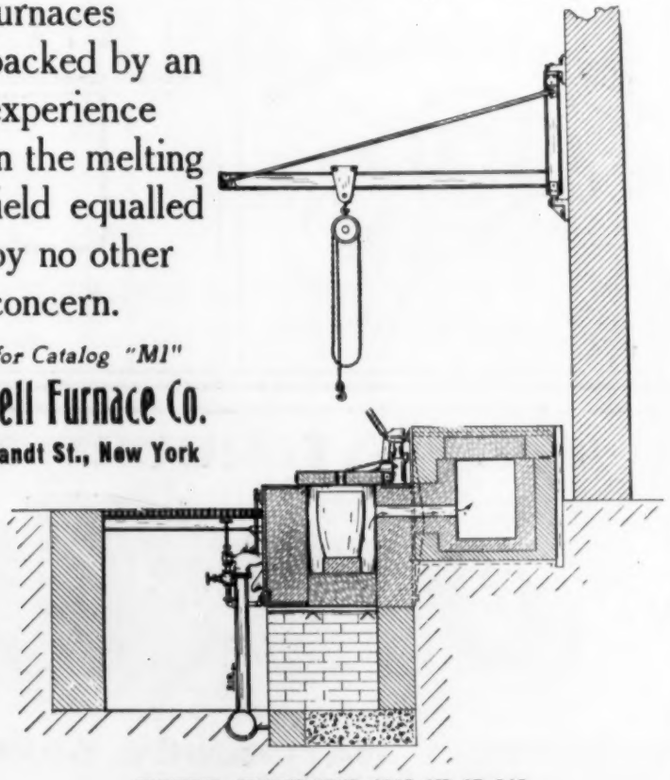

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The Brand of Quality

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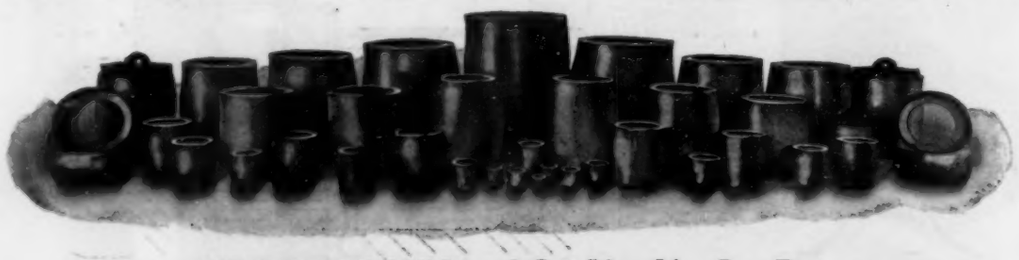

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The Kind That Last

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Blacklead CRUCIBLES and RETORTS
TAUNTON, MASS.
Established 1865

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Send for List of Sizes and Prices

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Highest grades of basic brick and special shapes for lining metallurgical furnaces

Sole manufacturers of the
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Especially adapted to metallurgical work. Write us about your furnace lining troubles and for catalogue.

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All sizes and for all purposes.

No. 0 to No. 400.

Established 1866.

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Philadelphia Black Lead Crucible Works,
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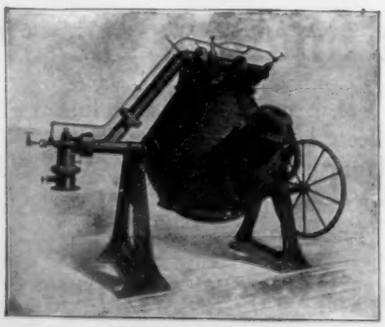

6 Sizes, 100 to 20,000 lbs. per heat. Fuel: oil or gas

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MALLEABLE IRON, GREY IRON, STEEL

ALL LINES LEAD TO
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Air Furnace : Bessemer Converter : Open Hearth Furnace
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Special Furnaces constructed to meet all metallurgical conditions. Send for New Catalog containing valuable data on Metallurgy

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Brass Foundry Equipment

HIGH GRADE AND MODERN

We Install Complete

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WE DESIGN AND BUILD SPECIAL EQUIPMENT

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THE LATEST AND BEST

Improved Portable Core Oven

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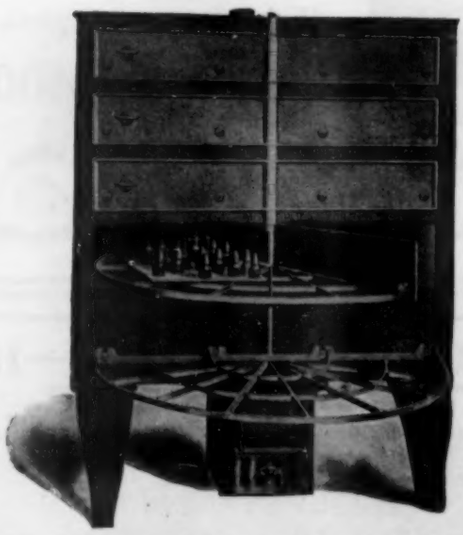

More Shell Room. No Escape of Heat in Loading or Unloading. Economical in Fuel. Practical in All Respects.

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Also Manufacturers of Graphite, Plumbago, Foundry Supplies and Equipments.

YOU can dip this into a pot of brass 500 times and read the exact temperature on a **HOSKINS HEAT GAGE.**

PRICE $50.

STRONG
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Can you afford to guess?

We think not, because your zinc loss from overheated metal is many times the cost of our Heat Gage.
Send for Catalogue and list of users.

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The Largest Foundry Supply House In The World

Separate the Iron and Dross from the Brass

BY USING

"ESSO" Patent Flux

Melters of copper, brass, bronze, German silver, aluminum and alloys will find it a great help in melting, as the time is lessened considerably. It increases the fluidity of the metal, removes the oxide, and cleanses the metal from dross and impurities. It eliminates the gases, makes the product free from the usual porosity, and increases the electrical conductivity. In melting emery dust, buffings or burnt skimmings, results are very satisfactory, the product being clean and the slag free from metal.

Remember—We manufacture "Everything you need in your brass foundry"
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EVERYTHING YOU NEED IN YOUR FOUNDRY

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CINCINNATI CHICAGO PITTSBURG

Canadian Agents: The Dominion Foundry Supply Co., Toronto and Montreal

We Have Been Manufacturing Since 1874

BASSITE

An alloy designed to take the place of TIN in the manufacture of Brass Castings

IT SAVES THE BRASS FOUNDER

fully 33⅓% of the usual outlay for Tin and 10 to 30% upon the cost of finishing castings

Sample castings made with Bassite will be forwarded to anyone interested, and 100 lbs. will be sent for trial with no obligation to pay unless our claims are substantiated

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Fluxine

Removes the iron from the brass and copper.

Prevents oxidation, thereby reducing the percentage of loss in melting.

Reduces the oxides to their metallic state.

Produces a more homogeneous alloy and causing a greater fluidity in the metal which prevents blow holes.

Imparts a greater tensile strength to the metal. Positively removes all impurities in metal. We guarantee to save you from five to six per cent in melting. Write for pamphlet and prices.

Put up in 50 lb. Trial Packages.

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THE FOUNDRY SPECIALTY COMPANY
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FOR PERFECT PARTINGS
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Suitable for Bronze, Brass or Any Other Metal

FAR SUPERIOR TO
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FOR Straight and Difficult Lifts; Sticky Patterns, Slanting Copes and Deep Chasings

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Sharper Castings — Smoother Surfaces
Perfect Corners — Easier Lifts

DOGGETT'S PARTING
PERMITS
Swabbing and Slicking—Will not burn off the face of the mould, wash or cut.

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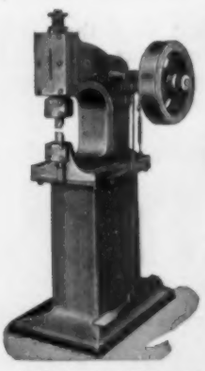
Working Samples Sent Free Upon Request



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What you need is a SHUSTER FOOT LEVER or POWER SPRUE CUTTER. Soon pays for itself in time and labor.

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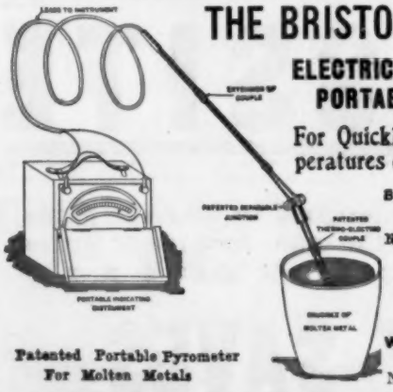

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ELECTRIC PYROMETERS
PORTABLE OUTFITS
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MONARCH CRUSHER AND PULVERIZER

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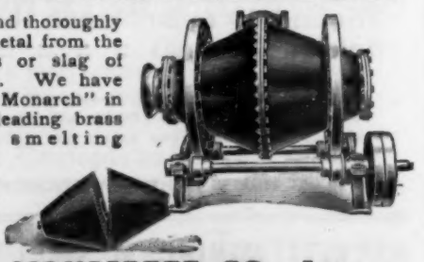

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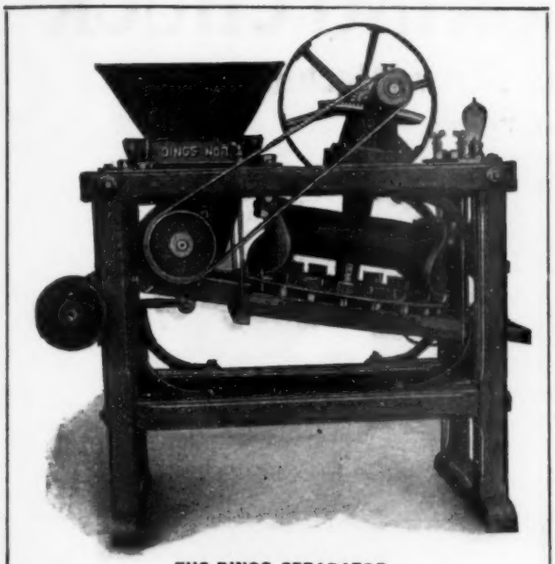

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DIFFERENT KINDS AND SIZES MADE
TO SUIT ANY REQUIREMENTS

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MOST PRACTICAL, EFFICIENT AND ECONOMICAL

For BRASS FOUNDERS and all other purposes requiring the separation from Magnetic Metals.

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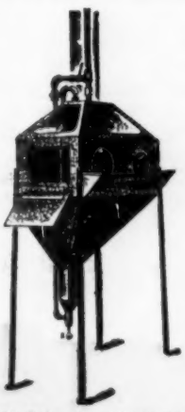
ALL READ

THE METAL INDUSTRY ADS.



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For all classes of work. Used with foot bellows or blower.

PRESSURE BLOWERS

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Noiseless—Steady Flow

NEW FOUNDRY SAND BLAST with Hose **$45** Complete

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GOLD MEDAL AT JAMESTOWN

OTTO

The U. S. Government paid this company a big compliment when it selected the "OTTO" Engine for use in making fuel tests at the Jamestown Exposition.

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The "OTTO" has won FIRST PRIZE at every large Exposition held in this country since the Centennial in '76.

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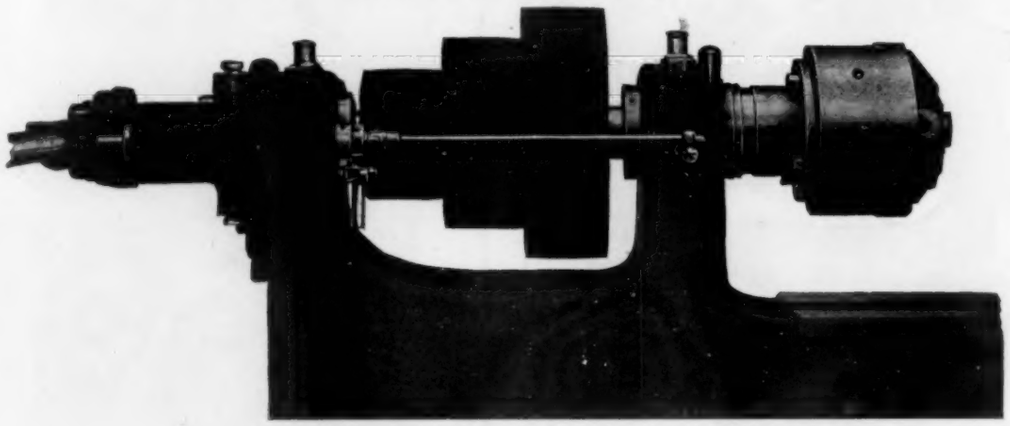
THE MANUFACTURING CHUCK

For Monitor Lathes and Screw Machines

Patented and Others Pending



The above cut shows the front view of a monitor lathe equipped with the chuck, air cylinder, and with hand power lever ready when wanted.

Your attention is called to the latest chucking device herein described, which has no equal for rapidity and efficiency. While this chuck will do all and everything that any other chuck will do, there are eight distinct features contained in it not to be found in any other now on the market.

First. It can be operated by hand lever or air pressure at the will of the operator. Should the air line fail, the machine or job will not be delayed or put out of commission one minute. Use the hand lever.

Second. The jaws open and close parallel with each other. A very important feature.

Third. The stops on the pull rod can be set to allow the jaws to open full, or not, as required.

Fourth. Owing to the peculiar construction of the chuck and unlike any other device, it requires less power to tighten the work, because the levers multiply in power as they are pulled out.

Fifth. No chips or dirt can get into or clog up the working parts of the chuck.

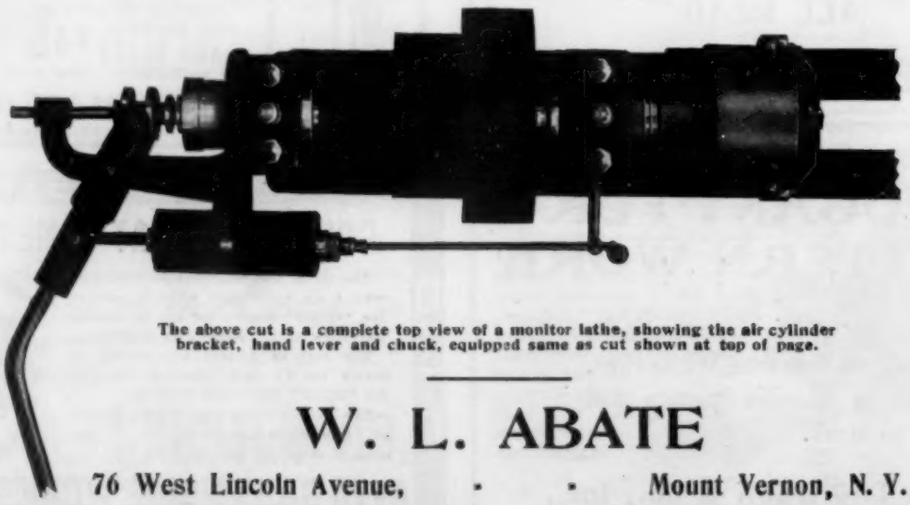
Sixth. The jaws can be adjusted individually 3/16 of an inch to and from the center so that if for any reason the castings or jaws should be out of true they can be set to perform the work satisfactorily.

Seventh. Pieces larger in diameter than the chuck can be gripped because the jaws are detachable and other jaws can be made, to fit any requirement.

Eighth. The chuck can be furnished at a slight extra cost to take bar stock up to ⅞" diameter.

There are many other things to be noted, among which are simplicity of attaching, requiring only three screws and the threading of the face plate. Rigidity, it projects but 6½" from the box of the lathe. Accessibility, as easy as a box chuck.

Let us send you one on a thirty-day trial and if not entirely satisfactory to you, return it to us at our expense.



The above cut is a complete top view of a monitor lathe, showing the air cylinder bracket, hand lever and chuck, equipped same as cut shown at top of page.

W. L. ABATE

76 West Lincoln Avenue, · · Mount Vernon, N. Y.

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MORGAN & WRIGHT

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VALVE DISCS

"They make good valves better"

MICROMETER GROUND FACES

M. & W. Discs are ground and polished in our new automatic machine which secures the absolutely parallel faces so necessary for perfeot seating. This, combined with rigid inspection and the use of a rubber stock specially compounded for steam and pressure work, guarantees perfection in every disc. Our tests and manufacturers' tests have proven it.

Do you want samples and our revised prices?

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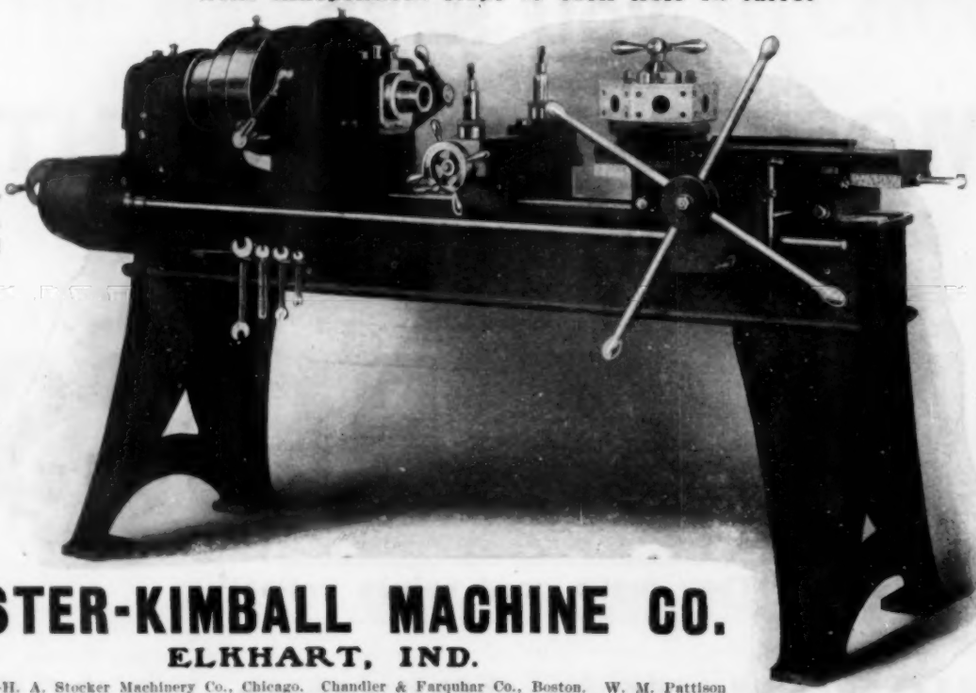
GEARED FRICTION HEAD TURRET LATHE

With independent stops to each hole in turret

Quick change gears to power feed giving four feeds. Machines furnished with or without Power Feed. Code Word, Waggish. No. 3 Machine has Round Turret.



Power cross feed to cut-off if wanted.

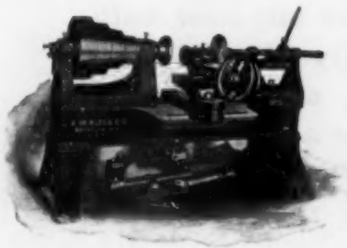
FOSTER-KIMBALL MACHINE CO.

ELKHART, IND.

AGENTS—H. A. Stocker Machinery Co., Chicago. Chandler & Farquhar Co., Boston. W. M. Pattison Supply Co., Cleveland. Patterson Tool & Supply Co., Indianapolis, Ind. C. C. Wormer Machinery Co., Detroit, Mich. W. P. Davis Machine Co., Rochester. The Frevert Machinery Co., New York City. W. E. Shipley, Philadelphia. Summers, Fitler & Todd, Pittsburg. J. W. Wright & Co., St. Louis, Mo. A. R. Williams Machinery Co., Toronto, Canada. Edgar Bloxham, Paris, France.

"BLISS"

"Presses for Every Purpose"



"BLISS" SPINNING LATHE NO. 6.

"Bliss" spinning Lathes, made in several sizes, for spinning, burnishing, trimming, and wiring the work produced in drawing Presses.

They may also be used for spinning from the flat.

These lathes are built in the most substantial and careful manner, with hammered steel spindles, bronze metal-boxes, and heavy compound slide rests. They are supplied either right- or left-handed, and for either inside or outside spinning. The hardened steel burnishing roll is provided with anti-friction bearings to prevent heating.

E. W. BLISS COMPANY

23 ADAMS STREET BROOKLYN, N. Y.

HYDRAULIC JACKS

If this particular style is not what you have in mind, remember, this is only one of over 250 styles that we make. Jacks for every jack need—whether you work in cramped quarters or have lots of room—"W-S" Jacks "fill the bill" best. Suppose you write for the "Jack Book."

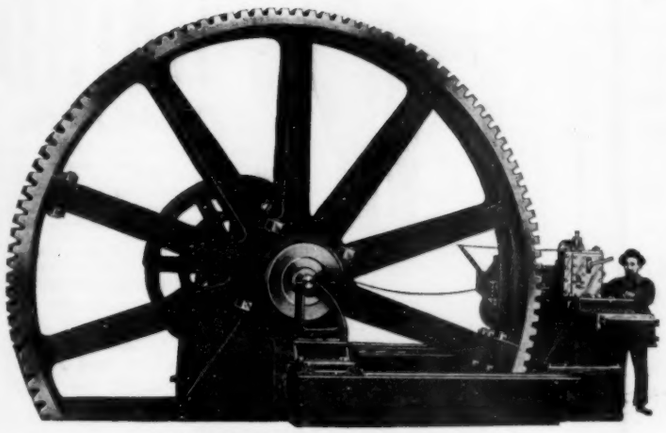
WATSON-STILLMAN COMPANY

Chicago Office, 453 The Rookery *50 Church St., N. Y. City*

FOR INDEX TO ADVERTISEMENTS SEE PAGE 36

FARREL FOUNDRY & MACHINE CO.

ANSONIA, CONN.



CUTTING TEETH IN 16 FOOT DIAMETER GEAR

BUILDERS OF

Rolling Mills

For Brass, Copper, Lead, Tin, Zinc, Aluminum, Britannia, Silver, and the softer metals—up to the largest sizes

Chilled and Gray Iron Rolls

HEAVY CASTINGS

Alligator Shears, 8 sizes — Roll Grinding Machines — Gate Shears — Railroad Cranes
Cinder Grinders — Cabbaging Presses — Sheet Metal Straighteners
Lead Pipe Machinery — Coil Friction Clutches (Pat.) for any speed or power
Gearing—Cut, Machine-moulded, Pattern. — Shafting, Pedestals, Couplings, Etc.

Cold Rolling Mills

For rolling strips of iron, steel, brass, copper, etc.

Walzmaschinenfabrik

August Schmitz

Dusseldorf 64
Germany

ROLLS

FOR STEEL, IRON, BRASS, COPPER AND RUBBER WORKS

Philadelphia Roll & Machine Company

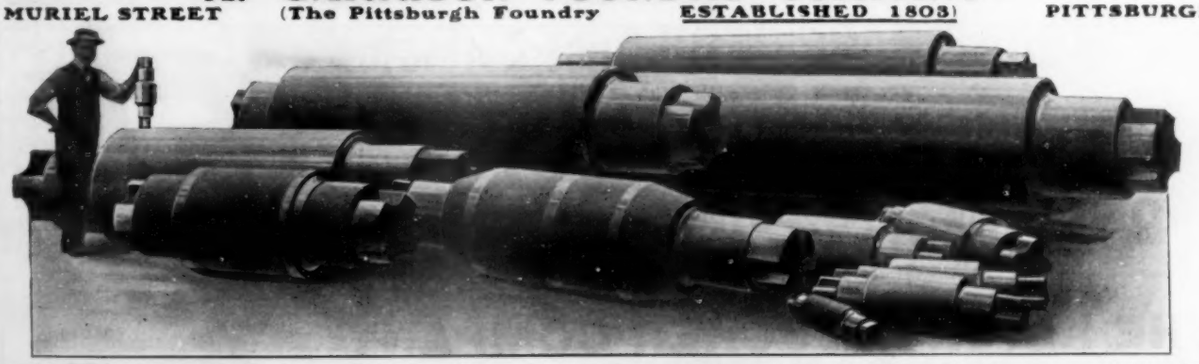
23d Street and Washington Avenue, Philadelphia, Pa.

Western Sales Agent,
CHARLES R. BRYSON,
501 Curry Bldg.,
Pittsburgh, Pa.

Cable Address:
"Philrollco., Philadelphia."
Long Distance and Local 'Phone:
Locust 825.

A. GARRISON FOUNDRY COMPANY

S. MURIEL STREET (The Pittsburgh Foundry ESTABLISHED 1803) PITTSBURGH



Our particular business is making Chilled Rolls. We make Chilled Rolls weighing 37½ lbs. for rolling gold and silver, and Chilled Rolls weighing 70,000 lbs. for rolling steel plate. The first Chilled Rolls made in America were made by us and we have made a specialty of Rolls and Rolling Mill Machinery ever since; for one customer in particular, of more than National prominence, we have made Chilled Rolls continuously since 1843.

"THE ATLAS"

No. 1 Bench Power Press
A HANDY MACHINE FOR MANUFACTURING.
DELIVERY FROM STOCK.

Power, Foot and Drop Presses, Spinning, Edging, and Turning Lathes, Clock or Manufacturing Drills.

Slitters, Flattening and Straightening Rolls. Tube, Rod and Wire Draw Benches.

Special Machines Built on Contract to your Drawings.

Send for Catalogue M.

THE ATLAS MACHINE CO.
31 CANAL STREET WATERBURY, CONN.

Table 16" x 24"
From Floor to Top of Bed 36"

POUNTING MACHINERY
BAIRD
MACHINE CO. OAKVILLE, CONN.
FORMING MACHINERY

BAIRD

Pendulum Foot Press.

¶ This press enables one to do more and better work with less strain and fatigue than other presses. ¶ That's because the Pendulum Lever is made to conform to the free, easy, natural movement of the foot. ¶ Sent on trial to responsible parties.

Circular B 2 and 3

THE BAIRD MACHINE CO.
OAKVILLE, CONN., U. S. A.
TELEGRAPH ADDRESS WATERBURY, CONN.

The TORRINGTON MANUFACTURING CO.
TORRINGTON, CONN.

Finishing Machinery for Brass and Copper Mills to Order

Acid Cleaning, Steam and Sawdust Drying-out Machines.
Power Presses, Single and Double Action Cam or Crank.
Flattening, Straightening and Overhauling Machinery.
Multiple Plunger, Cut and Carry Presses.
Slitters, Scrap Cutters and Coilers in a variety of Styles and Sizes.
Channel Iron Mill Trucks to suit any Requirement.
Metal Saws and Power Shears.
Drawbenches.

SPECIAL MACHINERY AND TOOLS OF ANY DESCRIPTION

Annealing Without Oxidation by Automatic Machines
BATES & PEARD ANNEALING FURNACE CO.
C. M. DALLY, Agent, 29 Broadway, N. Y.
NO PICKLING
NO SCALE
Large Saving in Labor and Fuel
Illustrated Catalogue Sent on Application.

MILLER ELECTRIC CO.
16-20 William St., NEWARK, N. J.
Importers and Manufacturers of
Platers' and Polishers' Supplies
HIGH-CLASS POLISHING WHEELS
For Grinding, Buffing and Polishing
Makers of the Celebrated "WALRINE" Leather Wheel

The "MORSE RAREFIED" Dust Collector

For Use in Connection With
EMERY WHEELS, POLISHERS, TUMBLING MILLS, ETC.
No Cloth No Moving Parts

No Dust Reaches the Fan

Shipped Anywhere in the United States on 60 Days Trial

MANUFACTURED EXCLUSIVELY BY
THE KNICKERBOCKER COMPANY
JACKSON, MICHIGAN

Send for Catalog "M"

NEW DISC SURFACE POLISHER

Designed to polish any flat surface from the rough to a buff finish. Any kind of metal or wood can be ground or polished on this machine.

For FITTINGS, VALVES, SURFACING CASTINGS, FORGINGS, PLATES, TYPEWRITER PARTS, TELEPHONE PARTS, STOVE CASTINGS and all work where a true and polished surface is required.

For the MACHINE SHOP and TOOL ROOM it will do the work in less time and with less cost for labor than any other tool. The cutting discs are sized with Carborundum or Adamite of suitable grain to give the desired finish. These discs are cemented to a steel plate, which is interchangeable. A coarse disc for roughing or cutting down may be cemented to one side of the plate and a finer disc for finishing cemented to the opposite side of the plate.

These machines are built in two sizes, a press for cementing the cutting discs to the steel plate and a patent countershaft are furnished with each machine.

No. 2 with 20 in. disc. Any work up to 16 ins. long by 8 ins. wide can be polished on this machine.

No. 3 with 26 in. disc. Any work up to 21 ins. long by 10 ins. wide can be polished on No. 3 machine.

Write for No. 5 catalogue and prices.

Bennett & O'Connell Co., Inc.

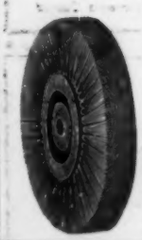
Everything for Electro Plating, Polishing and Buffing

97-99-101 So. Clinton St. CHICAGO, ILL.

BRUSHES

Brass, Copper and Steel Wire Brushes
An assortment of Machine and Circular Brushes.—
Chandelier Manufacturers', Silver and Nickelplater's Brushes, etc.

Repairs Promptly Attended to.



HERMANN BLUMENTHAL & CO.
Manufacturers
241-243-245 CENTRE ST., NEW YORK

The ECONOMY
WIRE WHEEL

In any shop where there is cleaning of metal to be done an ECONOMY should be used.

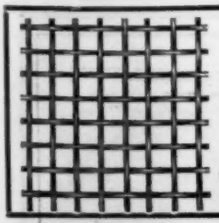
Let us tell you more about it.

One man with an ECONOMY will do as much work as Five Men by other methods.

Ask for Booklet No. 111.

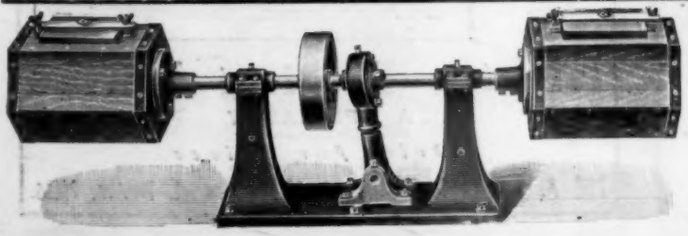
THE OSBORN MANUF'G CO.
CLEVELAND, O.

IF YOU READ THIS SIGN, OTHERS WILL READ YOURS



BUFFALO WIRE WORKS CO.

WIRE CLOTH WIRE SIGNS, WIRE WORK ARTISTIC METAL WORK SEND FOR OUR CATALOGUE No. 6-C **BUFFALO, N. Y.**



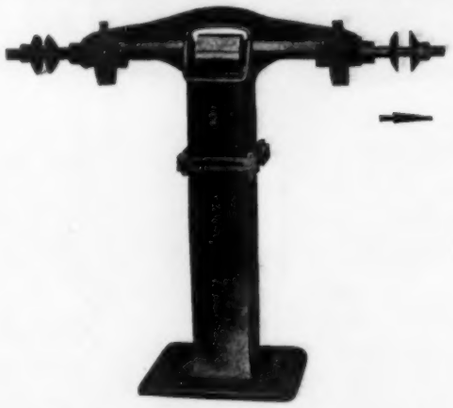
Edmonds' Patent Shaking Machines

Polishing and Burnishing without Hand Labor Saves Time and Money for Manufacturers of Brass Foundry, Jewelry, Etc.

The United Wire and Supply Company

Agents: 109-119 Summer St., PROVIDENCE, R. I.

No. 2 Self-Oiling Lathe



THIS lathe, manufactured by us, is the result of years of experience in the manufacture and sale of buffing and polishing machines. Furnished with crucible steel shafts, dust proof bearings, cast iron boxes.

We are manufacturers and dealers in plating and polishing supplies, and solicit an opportunity to submit quotations.

CHAS. F. L'HOMMEDIEU & SONS CO.
99-101 S. Clinton Street, Chicago, Ill.

A Better Polish With Less Power

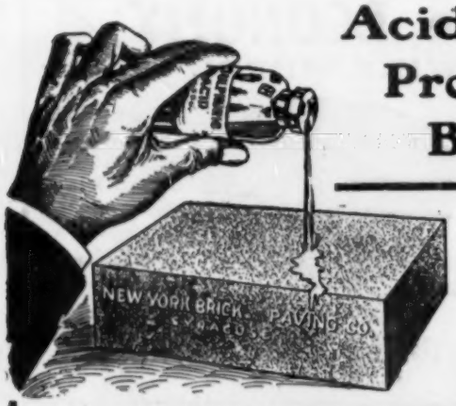
The "Whitney" Jack eliminates so many of the frictional elements of the old style polishing machine, that on the basis of this saving alone, 'twould pay you to investigate.

Then, too, there's the assurance of a smooth running wheel, the ability to start or stop in 5 seconds, the absence of belts in the room, and many other advantages equally important.

May we not post you?

THE NEW BRITAIN MACHINE CO.
200 CHESTNUT STREET
NEW BRITAIN, CONN., U. S. A.

Acid-Proof Brick



FOR TWELVE YEARS

we have been manufacturing a high-grade Acid-Proof Vitrified Non-Absorbent Brick suitable for Acid Tanks, Plating Room flooring, etc., etc.

These brick immersed in a 50% Sulphuric Acid solution for several months show no signs of deterioration.

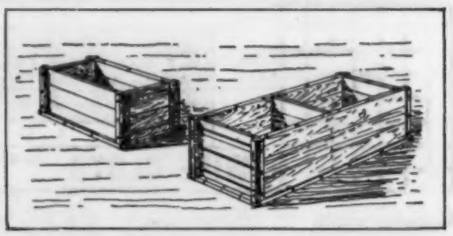
INQUIRIES SOLICITED.

NEW YORK BRICK & PAVING CO.
Syracuse, N. Y.

AMES SWORD COMPANY
CHICOPEE, MASS.
Manufacturers of
ENDLESS SEWED POLISHING BELTS
Correspondence Solicited *Discounts Quoted*

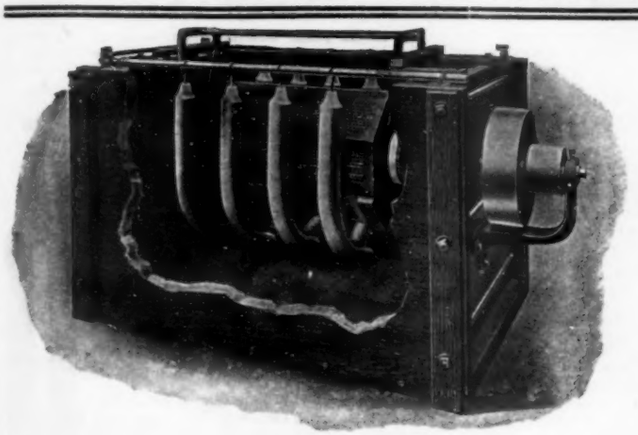
POLISHING BELTS and TAPE
ALL KINDS
Any width or thickness made to order on short notice and large stock always on hand.
GILMER COMPANY
PHILADELPHIA PA.

TANKS



Electro-Plating Tanks
A SPECIALTY
Write for Prices
THE A. T. STEARNS LUMBER CO., Neponset, Boston, Mass.

MECHANICAL ELECTRO-PLATING APPARATUS



STYLE "B"

Patented June 22, 1897, Feb. 24, 1903, Oct. 11, 1904.
Other patents pending.

The most efficient plating apparatus in the market. Over 500 in use by the trade.

We will finish sample lots of work without charge.

This apparatus is a proved money saver where small work is to be plated. Can be used in Nickel, Copper, Brass, Zinc and Silver Solutions.

No Stringing. No Wire Used. No Metal Plating Trays or Baskets. No Unstringing. No Loss of Metal.

Capacity: 50 lbs. to 500 lbs., according to size.

Basket can be removed at will—without interfering with drive. In larger sizes basket is raised and lowered automatically.

Useful for plating: Bolts, Nuts, Rivets, Screws, Buckles, Ferrules, Typewriter and Sewing Machine Parts, Lamp Fixtures, Saddlery and Trunk Hardware, Carriage Trimmings, Screw Tops, Shells, Stove Fittings, Locks, Keys and small work.

Apparatus is Used for Electro-Galvanizing Small Articles

We Can Furnish a List of Over 200 Users of this Apparatus. Many of the Larger Firms Are Using 10 or more

WRITE FOR BULLETIN No. 113

The HANSON & VAN WINKLE COMPANY

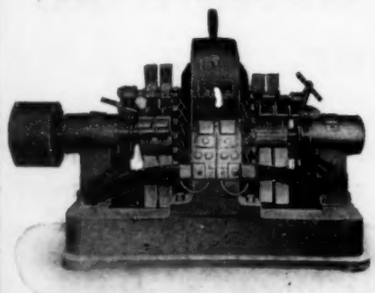
Manufacturers of Dynamos from 50 to 5,000 Ampere Capacity, and all Supplies for Electro-deposition.

(WRITE FOR BULLETINS 105 and 112)

Main Office and Factory
219-221 Market Street,
NEWARK, N. J., U. S. A.

Branches
28 South Canal Street,
CHICAGO, ILL., U. S. A.

DYNAMOS



For Electroplating, Electrotyping and Electro-Galvanizing in single, two and three voltages

60 to 10000 Amperes, 3 to 30 Volts

Shunt, compound and separately excited

Write for Catalogue

CHAS. J. BOGUE ELECTRIC CO.
513-515 West 29th Street
NEW YORK

Cable Address "MACHELECT"

'Phone, 881 Chelsea

E. REED BURNS

MANUFACTURER OF

Brass and Nickel Platers' Supplies

40 and 42 WITHERS STREET
BROOKLYN, N. Y.

WRITE FOR PRICES

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W. CANNING & Co.
BIRMINGHAM
(ENGLAND)

Manufacturers of

ELECTRO-PLATING & POLISHING MACHINERY, MATERIALS & CHEMICALS

LOW VOLTAGE DYNAMOS from 20 to 3000 Amperes for Electro-Depositing, Metal Refining, etc. CANNING'S "SPECIAL" Nickel Salts, "LUSTRE" Polishing Composition.

Contractors to H. M. Government and other Governments, Railways, etc. **Established 1785**

THE TRIPLEX BUFF

A New Buff that is rapidly supplanting all other kinds. The letters printed below prove that old style Buffs are now obsolete

In 1907 this Buff was patented; since then its success has been almost phenomenal. The secret of its great wearing qualities is in the FOLD. Its economy is due to the fact that EVERY STRAND OF MUSLIN is used up in doing actual work. When the wheels are worn down the stubs may be returned to us and made into new wheels at nominal cost, using two old wheels to make one new wheel of approximately double the diameter of the old. Read what a few of our customers say:

Victor Talking Machine Co., Camden, N. J.

With one [Triplex] wheel we buffed four hundred pieces of our part 714A and three hundred pieces of our part 705A, while with one of our regular buffs we can do only two hundred pieces of our part 714A and two hundred and fifty pieces of 705A, both buffs using about the same amount of Tripoli, but the Triplex buff is much cleaner. Therefore, according to this report, the Triplex buff does more than again as much work as an ordinary buff.

Pittsburgh Lamp, Brass and Glass Co., Pittsburgh, Pa.

We have been using buffs made under the Painter Patent since June 18th last, and notwithstanding our increased business this year, our saving in buffs alone has been about $500, and we feel safe in saying that these savings will exceed at the rate of $100 per month for the year 1907. Our foreman's account shows that one wheel made of eight sections, eighteen ply each, under the Painter system, **has done as much work as three wheels of same dimensions and quality made of loose buffs.** In Tripoli composition we find a saving of about 20 per cent.

In addition to the above, our men are doing more work, better work, and they claim with an expenditure of less labor and physical force.

The Bryant Electric Co., Bridgeport, Conn.

We consider them to be the best buff we have ever used at any price, and we expect to use them practically exclusively when our stock of the old type is exhausted.

John L. Gaumer, Philadelphia, Pa.

Economy, therefore, will dictate that your Patent Buffs will take the place of the old methods.

Send for Description of our New Two-Bar Silverite Nickel Anode

IMPORTANT NOTICE

Any folded buff not stamped with our trade mark "TRIPLEX," used or sold is an infringement on our license patent and our rights in this respect will be strictly enforced.

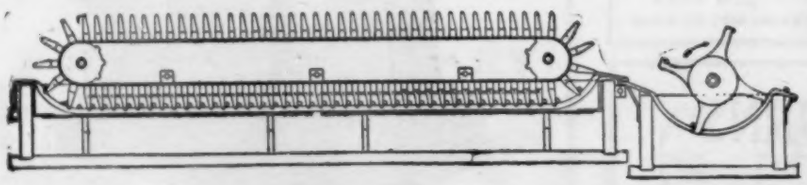
We will gladly send a man to demonstrate these wheels on your own work. Send in your orders NOW—they will be filled in regular order at current prices. Send for descriptive bulletin TB.

ZUCKER & LEVETT & LOEB CO., New York City, U. S. A.

Electro-Galvanizing Outfits Without Royalty on Solution. Low Voltage Generators; and Direct Connected Generator Sets, 50 to 10,000 Amperes Capacity. Complete Plants Installed and All Supplies for Electro Plating and Polishing.

Patent Electro Galvanizing at Half the Cost and Far Better.

We have a number of newly patented devices, which handle almost 90 per cent. of material automatically. One of them is our patent bar iron tank shown herewith. Coating absolutely perfect and smooth. Advantages: Exceptional low cost of galvanizing. No experienced labor required. Works perfectly, automatically and continuously. Thickness of coating can be regulated by increasing or reducing speed. Capacity of one tank 3 to 6 tons per 10 hours. PLANTS furnished for treatment of any kind of material. JOBBING work done at our factories and branches. Apply for prices, particulars, etc., at the most conveniently located address given below.



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U. S. ELECTRO GALVANIZING CO.

("INC. 1896")

MAIN OFFICE and FACTORY, 1 to 9 Park Ave., BROOKLYN, N. Y.

BRANCHES:

INDIANA GALV. & MFG. CO., Anderson, Ind.

KANSAS CITY GALV. & MFG. CO., Kansas City, Mo.

CALIFORNIA INDUSTRIAL CO. Los Angeles, Cal.

PITTSBURGH ELECTRO-GALVANIZING CO., Pittsburgh, Pa.

"Nikolas" Lacquers the Cheapest

"All work of quality must bear a price in proportion to the skill, time, expense and risk attending the invention and manufacture. Those things called dear are, when justly estimated, the cheapest."

Our Lacquers are always of a good reliable quality and will prove more economical than the so-called cheap kinds.

G. J. NIKOLAS & CO.

400-2 W. Van Buren Street CHICAGO, ILL.

Why Experiment?

When you have put hard earned dollars into finish that has cost you much time and labor, why try to save a few cents on the lacquer that preserves it?

Barrett's Lacquers

are the outgrowth of many successful experiments continued through years, whose results have been proved and tested at our expense. You save the cost of experiments when you buy Barrett's.

M. L. Barrett & Co.

MANUFACTURERS

219 Lake St., Chicago

70 %

of Our Customers Have Ordered Extra Machines of Us

WHY?

THE DALE COMPANY, Manufacturers of Electric & Combination Fixtures, 9th Ave. and 13th St., New York.

To the Eureka Pneumatic Spray Co., 400 Canal St., New York.

Gentlemen: We take pleasure in informing you that after two months' trial of your lacquer spray apparatus, we have found that it is all that you claim it to be and more too. We are able to distribute colored lacquer on our polished brass work more evenly than we could do with a brush, and notwithstanding the fact that you did not recommend it for this purpose: We also find that it saves us considerable lacquer, as our bills for lacquer have fallen off from 25% to 30% since we have placed our spraying plant in operation, and we will be only too pleased to recommend it to other manufacturers of metal goods should the occasion arise for us to speak a word in behalf of your lacquer spray apparatus.

Yours very truly, THE DALE CO.

It will pay you to apply your Lacquer, Japan, Paints, etc. by our Process. Write for information.

EUREKA PNEUMATIC SPRAY CO., 400 CANAL ST. NEW YORK

DO YOU

Want to turn out the best lacquered work on the market?
Want to save time and money?
Want to avoid worry and keep yourself up-to-date in lacquering?
The easiest, surest, quickest, most economical and perfect way is to use the Lacquers made by

The Egyptian Lacquer Manufacturing Co.

152 Front Street, New York City

Chicago Stock Rooms, 176 So. Clinton Street

See page 34 for a List of the Principal Articles on the Founding, Finishing and Plating of Metals, that appeared in

The Metal Industry

IN 1907

The Most Valuable Ever Published

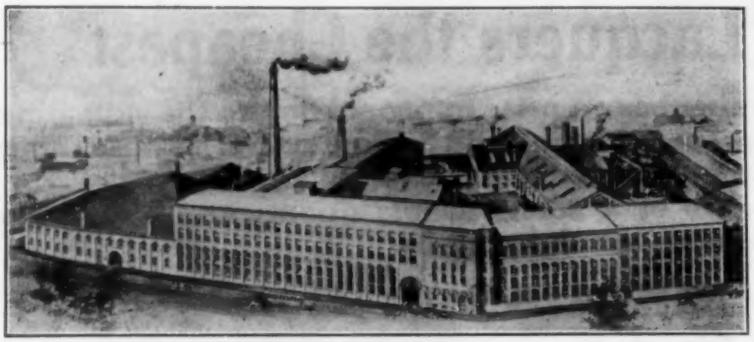
THE HIGHEST DEGREE of PERFECTION in BRONZE CASTING may be obtained by the

Janitschek Patent Process

EXCLUSIVELY

Lost Wax, False Core and difficult Art Casting of every description for the trade.

JANITSCHEK COMPANY, INC.
33 UNION SQUARE, NEW YORK



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We shall be pleased to send you the catalogue in which you are interested. Just mention it by the letter. :: :: ::

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A Automatic Nut, Bolt and Rivet Machinery. Thread Rolling Machines.
B Machinery for manufacturing Hinges and Butts from Sheet Steel and Brass.
C Cartridge Machinery for making Metallic Cases, Bullets, Paper Shot Shells, Primers.
D Drop Presses. Automatic Drop Hammers for forging.
F Foot Presses and Screw Presses. Button Covering Foot Presses.
G Chain Draw Benches for Tubing and Rods. Bull Blocks.
H Hydraulic Draw Benches. Presses. Accumulators. Power Pumps. Valves.
K Knuckle Joint Embossing Presses. Horizontal and Special Presses.
L Lathes for Burnishing, Knurling, Trimming and Spinning Sheet Metal.
M Single Acting Open Back Power Presses. Automatic Feeds.
N Blanking and Drawing Presses (Arch and Pillar Patterns) with Feeds.
P Double Acting Power Presses. Crank, Cam and Toggle Action Presses.
R Rolling Mills for Rolling Sheet Brass, Copper, Steel, Tin Foil, etc., Rod Rolls.
S Shear Presses and Alligator Shears. Single and Gang Slitters and Rotary Trimmers.
T Finishing Machinery for Sheet Brass, German Silver, etc. Furnaces.
X Special and Miscellaneous Machinery. Roll and Die Grinders.
List of Gear Patterns. Price List of Shafting and Pulleys. The Rodd Nut Tapper.

THE WATERBURY FARREL FOUNDRY & MACHINE CO. WATERBURY CONN., U.S.A.

New York Office, 90 West Street **Western Office, 1012 Williamson Building, CLEVELAND, O.**

ARE YOU CHASING THE DOLLAR?

You, doubtless, are, for that is the constant effort in business management.

The ultimate hope is for sufficient accumulation for peace and quietude during the declining years.

You will find a help in that direction in the use of my buffing compositions.

That composition which will produce the greatest effect—that will do the most work, with the least quantity used—will help you to catch the dollars. That is the one idea I have in the manufacture of my buffing compositions and platers' supplies.

A smaller quantity of my "TRIPOLI COMPOSITION" contains more abrasives—more cutting qualities—than any other Tripoli Composition on the market. That is the reason that it gives such universal good service and therein lies the economy in its use. There is more concentrated energy in one lb. of my Tripoli composition than in two lbs. of any other.

This is a pretty broad statement but it may easily be proven at my expense. I am ready to prove it. I will send samples for test by Express prepaid.

For "coloring up" brass castings, such as valves, brass fittings—spun brass or cast brass—use my "WHITE COLUMBIA COLORING" on cotton buffs, equally effective on nickel plate with smooth surfaces.

For nickel plate with raised surfaces and deep backgrounds, use "STEVENS' SILVER FINISH" on Spanish felt wheels. Then, your nickel plate will have the lustre of silver. Money won't buy anything better, and for a dollar you get a little more than a dollar's worth—in actual service.

Concentration is the order of the day; concentrate your orders with me for BUFFING COMPOSITIONS, SPANISH FELT WHEELS, CANVAS WHEELS, BULL NECKS, FOUNDRY FACINGS and SUPPLIES. I manufacture them all and all bear the stamp of "quality."

FREDERIC B. STEVENS, Cor. Larned & Third Streets, DETROIT, MICH.

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